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ABSTRACT

This review and synthesis of research in business and office education is based on doctoral dissertations and some independent studies completed between 1968 and 1980. Approximately twelve hundred studies are reviewed and represent the following major content areas: philosophy and objectives, educational environment, social and business environment, career education/careers, professional organizations (for teachers, students, and secretaries), bookkeeping and accounting, basic business education, communications, business mathematics, business data processing, shorthand and transcription, typewriting, and word processing. All the content areas are broken down into various subareas, such as objectives, curriculum, technology, teaching methods, evaluation, and the like. A comprehensive bibliography of the studies reviewed is included. (CT)

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Information Series No. 232

BUSINESS AND OFFICE EDUCATION: REVIEW AND SYNTHESIS OF THE RESEARCH

3rd Edition

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ERIC Clearinghouse on Adult, Career, and Vocational Education
The National Center for Research in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210

1981

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FOREWORD

The Educational Resources Information Center Clearinghouse on Adult, Career, and Vocational Education (ERIC/ACVE) is one of sixteen clearinghouses in a nationwide information system that is funded by the National Institute of Education. One of the functions of the Clearinghouse is to interpret the literature that is entered into the ERIC data base. This paper should be of interest to business and office education teachers, teacher educators, administrators, curriculum development specialists, researchers, and graduate students.

The profession is indebted to the following members of the National Research Project Committee of the graduate business education fraternity Delta Pi Epsilon for their scholarship in the preparation of this paper: Judith J. Lambrecht, University of Minnesota-Minneapolis; Marianne J. D'Onofrio, Utah State University; L. Eugene Jones, Northeast Louisiana University; and Patricia A. Merrier, University of Minnesota-Duluth. The publication was developed in communication with the Business and Office Division of the American Vocational Association; the division assisted in identifying reviewers for the paper. Recognition is also due Leona M. Gallion, Indiana State University; Anne Schatz, California State University-Los Angeles; and Marla Peterson, The National Center for Research in Vocational Education, for their critical review of the manuscript prior to its final revision and publication. Susan Imel, Assistant Director at the ERIC Clearinghouse on Adult, Career, and Vocational Education, coordinated the publication's development.

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

EXECUTIVE SUMMARY

This review and synthesis of research in business and office education is based on doctoral dissertations and some independent studies completed between 1968 and 1980. Approximately twelve hundred studies are reviewed and represent the following major content areas: philosophy and objectives, educational environment, social and business environment, career education/careers, professional organizations (for teachers, students, and secretaries), bookkeeping and accounting, basic business education, communications, business mathematics, business data processing, shorthand and transcription, typewriting, and word processing. All the content areas are broken down into various subareas, such as objectives, curriculum, technology, teaching methods, evaluation, and the like. A comprehensive bibliography of the studies reviewed is included.

Literature relating to the topic of research in business and office education can be found in the ERIC system under the following descriptors: Career Education; Accounting; Bookkeeping; Business Communication; *Business Education; *Business Skills; Data Processing; Educational Environment; Educational Objectives; Educational Philosophy; Mathematics; *Office Occupations Education; *Office Practice; Shorthand; Social Environment; Typewriting; Work Environment; *Educational Research; State of the Art Reviews. Asterisks indicate descriptors having particular relevance.

INTRODUCTION

This review and synthesis of research in business and office education includes doctoral dissertations and independent studies completed during the time span of 1968 to 1980. The volume of research during this period, the publication space allotted for the report, and the time available for completing the review precluded the inclusion of master's level studies. These same constraints required the elimination of certain subject areas, namely business teacher preparation, studies related to international business education, and office education.

This review and synthesis parallels two earlier publications from the National Center for Research in Vocational Education. In 1966, Lanham and Trytten authored a *Review and Synthesis of Research in Business and Office Occupations Education* covering the years 1960 through 1965. A second edition of this publication was completed in 1970 by Price and Hopkins covering the years 1966 through 1968. While these two prior publications were organized differently from the present review and synthesis, all have been concerned with the same body of research in business and office education.

The review has been organized according to the major content areas comprising business and office education, such as the following: accounting/bookkeeping, basic business/economics, business communications, business data processing, business math, shorthand, typewriting, and word processing. Research related to the philosophy and general objectives of business education, the educational environment of business programs, and the social and business environment affecting business education is reviewed in separate sections. Career education, and student and professional organizations are also treated separately.

The following resources were used to identify titles of doctoral or independent research in business education from 1968 through 1980:

1. Rahe, Harves. *Index to Research in Business and Office Education*. New York: Gregg and Community College Division, McGraw-Hill, 1974.

2. Rahe, Harves. *Index to Doctoral Dissertations in Business Education 1900-1975*. St. Peter, MN: Delta Pi Epsilon, 1975.

3. Rahe, Harves. *Index to Doctoral Dissertations in Business Education 1976-1980*. St. Peter, MN: Delta Pi Epsilon, In Press.

4. *Business Education: A Dissertation Catalog*. Ann Arbor, MI: University Microfilms International, no date.

5. *Business Education Index*. St. Peter, MN: Delta Pi Epsilon, 1968 through 1980.

6. Two computer searches of the Educational Resources Information Center (ERIC) database using the DIALOG Information Retrieval Service.

7. Manual review of the indices for *Dissertation Abstracts International*, Ann Arbor, MI: University Microfilms International.

8. Abstracts of doctoral studies compiled by Alpha Epsilon Chapter of Delta Pi Epsilon, North Texas State University, 1968 through 1979 issues.

9. Listings of doctoral studies in the libraries of Brigham Young University and the University of Tennessee.

Initial attempts were made to secure complete copies of research studies through interlibrary loan services or through personal loans from colleagues at universities where research had been completed. When the large volume of research to be reviewed became apparent, it was clear to the authors that time would not permit a thorough reading, nor would space in this publication permit a review of all the studies. Therefore, most of the synthesis of research in this volume is based on a reading of entries contained in *Dissertation Abstracts International*.

While the reading of abstracts permits the categorization of studies by the type of research questions addressed, abstracts alone do not permit a critique of the research design nor findings. Readers are cautioned that the examination of complete studies is necessary for verification of the conclusions contained in this report.

PHILOSOPHY AND OBJECTIVES OF BUSINESS EDUCATION

A limited amount of the doctoral or independent research for the period 1968-1980 has focused on areas related to the philosophy and objectives of business education. A total of twenty-one studies were reviewed; of these, three studies (14 percent) investigated philosophy of business education and education for business. Approximately one-half (53 percent) of the studies were historical accounts of business education. Twenty-four percent or five studies focused on the history of business education programs in the United States; 24 percent or five studies on the history of business education programs at the secondary level in selected states; and 5 percent or one study on the history of business education programs at specific universities. Three studies (14 percent) assessed contributions of business education leaders to the field of business education. A few studies (three or 14 percent) were directed toward identifying and analyzing major issues and trends in business education.

The most prevalent research method used by the researchers was the historical method, with some researchers using both historical and descriptive research methods in gathering data. Descriptive survey research methods were used in the studies investigating trends and issues in business education. Sources of the data analyzed in the studies were historical records and/or current records (71 percent or fifteen of the studies), and business education leaders, chairpersons, teachers, and business deans (24 percent or five of the studies). The following sections summarize the research in the areas of philosophy of business education, historical research, contributions of selected leaders, and trends and issues.

Philosophy of Business Education

Danieis (1970) delineated a philosophy of business education by synthesizing the thoughts of Elvin S. Eyster. Generalizations and supporting ideas were developed for use in the development and evaluation of business education curriculum.

The following year, McClung (1971) investigated the historical development of the significant philosophies of the public junior college in order to develop questions for examining the relationship between theory and practice. A comprehensive statement of philosophy for two-year occupational programs in public junior college business curricula was then developed to serve as a source for possible modification of existing philosophy and practices.

In 1973, Dewitt surveyed occupational teachers to assess their involvement in the total program of occupational education and their beliefs and recommendations for inservice teacher education in eleven areas of program planning and development set forth by the Policies Commission for Business and Economic Education in April 1971. The involvement of business/office occupations teachers and their beliefs and recommendations were compared with the other occupational teachers. Business/office occupations teachers generally did not differ from other occupational teachers in their involvement in the total program of business education.

Historical Research

Dykman (1969) undertook a comprehensive study of historical data (1917-1967) concerning secondary education and business education. Dykman noted the need to emphasize both education about business and education for business, and the need to keep abreast of changes in business.

Kostorizos (1977) employed an instrumental method of writing history to determine that a polarity existed in the secondary schools between specialized education and general education. Based on an analysis and comparison of the critical issues in business education during the pre-1960 and the post-1960 eras, recommendations for changes in the curriculum of business education were made. Kostorizos concluded that the business education curriculum must adapt to the changing sociocultural, technological needs of students.

The Langford (1969) study focused on identifying the most important contributors to the philosophy of public secondary business education, determining the consensus of thought in business education from 1890-1965, and developing a synopsis of the conceptual thought in public secondary business education. The most outstanding formulators of theory in business education, chosen by jury, were identified as: Paul S. Lomax, Hamden L. Forkner, Frederick C. Nichols, Elvin S. Eyster, and Herbert A. Tonne. Langford concluded that business education contributed to general education by providing economic education, by meeting the common objectives of general education, and by preparing individuals to be responsible citizens and technically competent workers in society. The primary purpose of business education is to prepare individuals in broad occupational areas while the secondary purpose is to assist in developing a marketable skill.

A history of commercial education in the United States since 1850 was completed by Weiss (1978). It traces the growth of clerical workers and the development of commercial schools and commercial courses in high schools. Weiss assessed how schools have contributed to the feminization of clerical work, the docility of clerical workers, and their tendency to acquiesce to the increasing degradation of their profession.

Mellon (1975) investigated the role of the entrepreneur-educators; i.e., the nineteenth century businesspersons who established and operated schools of business for a profit, to determine if they differed from their peers in other types of entrepreneurial endeavors. Mellon concluded that the chief difference between entrepreneur-educators and other entrepreneurs of the period 1850 to 1915 was related to their socioeconomic background.

Five of the studies reviewed focused on the history of business education in public schools. Fiber (1969), Thorne (1969), Torres (1979), and Wise (1971) traced the history and development of business education in the public secondary schools of New Jersey, North Carolina, Puerto Rico, and South Carolina, respectively. Hulbert (1974) reported on the status of business education in the public high schools of Indiana during the school years 1945, 1961, and 1970. The general finding was that economic, social, and political factors influenced the growth and development of business education in the respective states. The general conclusion reached was that increased emphasis should be placed on economic education for all students.

Bowman (1973) provided a review of the history of the Business Education and Secretarial Science Department at Oregon State University.

Contributions of Selected Leaders

Johnson (1972) used a biographical approach to present contributions of Herbert Arthur Tonne to business education. Theories and principles held by Tonne were presented through an analysis of his writings and contributions as a teacher and editor. Professor Tonne espoused the theory that business education should share in the responsibility for the total education of all pupils and that youth must be educated to be intelligent consumers with an understanding of the

national economy. Tonne also supported the theory that preparation for initial employment should no longer be the single goal of business education, that attention should be given to follow-up and to the retraining of workers in a changing business world.

Gwatney (1972) reported on the contributions of Paul S. Lomax to business education. A proposal by Lomax delivered in a 1957 lecture led to the organization of the Policies Commission for Business and Economic Education. Lomax believed business education content should be sociologically established. Gwatney also documented Lomax's philosophy of business teacher education.

In 1979, Delta Pi Epsilon, Inc., in cooperation with the Delta Pi Epsilon Research Foundation, published a large portion of the memoirs of Frederick G. Nichols, one of the early leaders of business education.

Trends and Issues

Three studies were reviewed that identified and analyzed issues in business education. The Kosak (1979) study identified, classified, and analyzed major issues in postsecondary vocational technical business education for the period 1966 to 1977, comparing the opinions of business education leaders and business education teachers about these issues.

Wiener (1973) identified major issues in community college education for business and analyzed opinions of the deans of instruction, business department or division chairpersons, and business instructors about these issues.

Worthington (1975) identified problem topics and alternative points of view in seven selected subject areas of public secondary school business education through a review of the professional literature from 1963 to 1973. Trends of business education thought were identified by comparing issues with parallel issues treated in similar studies in 1961, 1950, and 1939.

Through library research and a survey of the National Association for Business Teacher Education (NABTE) institutions, Lindsay (1981) studied the impact of selected demographic, economic, political, and technological developments on business education and competency-based education as a response to these developments. In assessing implications for the future of business education, Lindsay noted the need for some curriculum changes in business teacher education and education for business, for educational preparation that will avoid overspecialization, and for interaction and cooperative efforts among education, labor, management, and government.

Under the auspices of the Policies Commission on Business and Economic Education, major documents, referred to as "This We Believe. . ." statements, are also issued periodically concerning the goals and functions of business education on specific topics.

Summary

Most of the research reviewed under the topic "philosophy and objectives of business education" contributed to knowledge of the past history of business education, with a few studies directed to trends and issues.

Studies cited took different approaches to the philosophy of business education: Daniels synthesized the thoughts of Elvin S. Eyster to form a basis for curriculum development and evaluation; McClung's historical survey of the philosophies of public junior colleges led to the development of a comprehensive philosophical basis for two-year postsecondary occupational programs; and Dewitt presented occupational teachers' individual assessments of their involvement in occupational education and their recommendations for inservice programs.

The historical studies examine the purposes and future directions of business and office education, as well as show what factors have influenced its development thus far. While Kostorizos (1977) identified a polarity between specialized and general education on the secondary level, Langford (1969) points out that the two share common objectives and that business education contributes to general education in a variety of ways. Langford also saw the development of marketable skills as secondary to the preparation of individuals in broad occupational areas.

Dykman's comprehensive historical study (1969) and Kostorizos' comparison of the pre-1960 and post-1960 eras respectively emphasize the need to keep abreast of business and the changing sociocultural and technological needs of students. In addition, the need for increased attention to economic education was a conclusion reached by researchers examining the public school business education in various states and Puerto Rico. These same studies showed influence of economic, social, and political factors on the development of business education programs.

Other retrospective studies have examined the history of commercial education and its relationship to the current status of clerical workers, (Weiss 1978); the role of the nineteenth century entrepreneur-educator (Mellon 1975); and the history of business education at one university (Bowman 1973).

Biographical approaches to the literature highlight the contributions and beliefs of leaders in the field. Writer and educator Herbert Arthur Tonne saw business education as an ongoing process in a changing business world, with responsibilities toward follow up, retraining of workers, and the general education of all pupils (Johnson 1972). Tonne would also have concurred with later studies indicating students' need for economic education.

Gwatney (1972) documented Paul S. Lomax's philosophies of business teacher education and the sociological basis of program content. Note that Langford's study, mentioned previously, also identified additional outstanding contributors to business education theory.

Current trends and issues for business education were researched in three studies through examination of the opinions of business education teachers, leaders, and administrators, and through literature reviews. Among future implications noted is the need for educational preparation that will avoid overspecialization, and for efforts between education, labor, management, and government.

With the impact of the changing economy, demography, public policies, and technology on the field of business education and business educational programs, the philosophy and objectives of business education in light of present history remain to be researched. Such research is imperative if business educators are to have the knowledge needed to make present decisions in light of future implications.

EDUCATIONAL ENVIRONMENT

A total of 116 studies that related to the educational environment of business education was reviewed. Educational environment includes supervision and administration, guidance, articulation, legislation, historical perspective, curriculum, general methodology, special needs, teachers, students, facilities, and business education programs at the secondary, vocational-technical, proprietary, and postsecondary school levels.

The following is a summary of the research methodologies used.

Research Methodology	Number	Percentage
Questionnaire Survey	56	48.28
Descriptive Test Data Analysis	24	20.69
Interview or Observation	16	13.79
Materials Analysis	7	6.03
Experimental	6	5.17
Materials Development	3	2.59
Historical	3	2.59
Delphi	1	.86
TOTAL	116	100.00

The distribution of the research among the school levels was as follows:

Level	Number	Percentage
Secondary	29	25.00
Vocational-Technical	8	6.90
Community/Junior College	22	18.97
College/University	10	8.62
Adult	2	1.72
Proprietary	3	2.59
Combination	42	36.20
TOTAL	116	100.00

The following sections summarize the research that applies to the entire field of business education rather than to a specific course or area within the field.

Administration and Supervision

A total of seventeen studies was related to the administration and supervision of business education programs. Ristau (1970) developed a business education model for methods and procedures of planning, programming, and budgeting systems (PPBS). Williams (1968) studied

the administration and supervision of business education programs. Harrington (1973) identified competencies needed for the administration of vocational education programs.

The role of local supervisors of business education was studied by Bober (1970), W. J. Taylor (1970), and Miles (1978).

Supervision of business education at the state level was investigated by Byrnside (1968), Thomas (1971), Banks (1974), and Daenzer (1976).

The business education department chairperson was studied by seven researchers. Godwin (1972), Faidley (1973), Faraci (1974), and Gorman (1980) focused on the high school department heads. Liebal (1971), Neuman (1972), and Hubbard (1977) studied community or junior college department heads.

Guidance

Three studies focused on the guidance functions in business education. These were completed by Billett (1972), Ellis (1972), and Knezek (1972).

Articulation

Articulation was the concern in ten studies. Popple (1979) compared the existing and recommended practices of articulation in business education. The articulation problems encountered by business students transferring from junior colleges to four-year colleges were studied by Brady (1971), Kadota (1974), Stanton (1978), Larsen (1979), Powell (1979), and Dragon (1980). Articulation between high school and postsecondary business education programs was investigated by Bernier (1969), Weishan (1973), and Mulcahy (1979).

Legislation

The impact of vocational education legislation on business education was studied by Elias (1970), J. D. Phillips (1971), Gump (1973), and Barnes (1978).

Historical Perspectives

The studies by Barosko (1972), Kostorizos (1977), and Brodel (1978) provide historical perspectives for business education in the United States.

Curriculum

A number of studies investigated environmental factors that have an impact on the business education curriculum at the various education levels. Factors influencing the community college business curricula were studied by Skiff (1972), Zaheer (1974), Huston (1976), Lindskog (1977), and Channing and Blanco (1980). Kerber (1972) investigated the adult education program. Others who studied the business curiculum included Kilbert (1980), Ricks (1975), Mitchell (1977), and Mohr (1977).

Methodology

Studies related to methodology having application to business education in general were completed by Stasulat (1970), Wiffler (1971), Fields (1972), Allen (1974), Henry (1975), and Schilling (1977).

Special Needs

Providing business education for students with special needs concerned several researchers. Disadvantaged learners were studied by Hough (1973), Matejisik (1976), Taylor (1974), Wood (1977), and McWilliams (1979). Myers (1980) investigated instruction for slow learners. Cox (1969) and Adams (1972) focused on black students. Sanchez (1980) studied bilingual students. Morton (1972) was concerned about blind students, Whelan (1972) about part-time employed students, and Brady (1977) with students from minority groups. Evans (1980) studied the needs of students in an opportunity school.

Teachers

The characteristics of business teachers were analyzed by Jurist (1974), Patterson (1974), Yaworski (1974), Jennings (1976), Hadaway (1978), and Otto (1979).

Students

The characteristics of business students were studied by Stadel (1969), Levin (1973), Searfoss (1976), Dawson (1976), Buckel (1976), Jackson (1977), and Kenny (1980).

Facilities

Only one study, Fuller (1972), was identified on business education facilities in secondary schools.

Business Education in Secondary Schools

Knott (1970), McNeill (1971), Hertz (1972), Reed (1976), Johnson (1970), and Weyrich (1976) reported on the status of business education in the public secondary schools in different states. Ferguson (1978) analyzed business education in one high school. Descriptive analyses of business education programs in selected secondary schools were completed by Rubens (1969), Morgan (1974), and Wallingsford (1974).

K. W. Brown (1970) and McFarland (1972) compared federally reimbursed vocational education programs with non-reimbursed programs in public secondary schools. Chialtas (1973) assessed curriculum standards and practices for business education in public secondary schools.

Vocational-Technical Business Education Programs

Kosak (1979) analyzed the major issues in business education in postsecondary vocational-technical schools. Burkett (1971) evaluated the business and office programs in vocational schools in Kentucky. Tomjack (1976) studied postsecondary programs in midwest schools. Stallard (1973) evaluated MDTA skills center programs.

Proprietary Schools Business Education Programs

Three studies involved the business programs in proprietary schools. Carr (1980) studied the impact of accreditation and degree status on proprietary schools in New York. Erickson et al. (1972) investigated funding of proprietary schools. Nelson (1975) studied the development of degree-granting proprietary schools in Illinois.

Business Programs at the Collegiate Level

Bergerstock (1975), Bydalek (1979), Carey (1977), and Hullinger (1972) studied business education programs in specific community colleges.

The business programs in specific four-year colleges were evaluated by Johnson (1970), Cornwell (1968), Cone (1971), Cox (1972), and McQueen (1976). Other evaluative studies of business education at the collegiate level were completed by Brenholt (1970), Walls (1973), and Wyant (1979).

Other Evaluative Studies of Programs

Studies involving evaluation of programs at two or more education levels were completed by Gray (1970), T. U. Johnson (1971), Weyrich (1976), Robon (1977), and Wire (1978).

Summary

Of the several topic areas subsumed under the category "educational environment," the area receiving the most attention from researchers is that of administration and supervision of business education. Concern ranged from competencies necessary for administering such programs to an examination of the roles of local and state supervisors, and the involvement of department chairpersons.

Areas that also appear to be well addressed include articulation problems, business education curricula, methodology, and student and teacher characteristics. While these areas have not been exhaustively examined, they have received more than a moderate amount of attention from researchers. Business education in many settings, including secondary schools, vocational teaching schools, proprietary schools and colleges, is another topic that has received much examination from several researchers.

Legislative topics and historical perspectives have received some attention by vocational education researchers. While there are only a few studies in this area, the topics seem adequately studied.

Several research areas, however, are underserved by current efforts and are deserving of greater emphasis. The guidance function would appear to be important in the face of a rapidly changing work force and research in this area should be increased. The area of educational facilities also needs more attention. As the work place increases its reliance on technology, vocational education will also need to maintain up-to-date perspectives on training and this includes utilization of appropiate facilities. Also deserving of more focus is the area of students with special educational needs. This is an emerging area of research and additional studies would greatly benefit educators and future employees, as well as students.

SOCIAL AND BUSINESS ENVIRONMENT

A total of 118 doctoral dissertations or independent studies has been reviewed in areas related to social and business environment.

Methodologies have been varied, as described in the following list.

Research Methodology	Number	Percentage
Experimental	5	4.2
Descriptive Test Data Analysis	57	48.3
Mailed Questionnaire	33	27.9
Observation/Interview/ Critical Incidents/Q-Sort	15	12.7
Materials Anaysis	8	6.8
TOTAL	118	99.9

Topic areas have also been varied and concern office technology/office careers, images of business and business education, job satisfaction, work values, sex equity and sexism, and training in business and industry. Findings are reported in the following section.

Office Technology/Office Careers

Several researchers have investigated the personal and/or work characteristics important for office workers (Hargis 1978; Hoggatt 1979; Kallaus 1973, 1970; Rudnitsky 1980; Scalamogna 1969; Tatham 1974; and Wagley 1975).

The general conclusion of researchers investigating the importance of characteristics for entry-level office positions was that personal characteristics were of utmost importance. Scalamogna (1969) also found personal characteristics to be of prime importance in the promotion process of beginning stenographic-secretarial workers.

However, in comparing perceptions of practicing professional secretaries and prospective secretaries, Whelan (1975) found prospective secretaries ranked secretarial duties as being more important for success than personal traits. Professional secretaries indicated personal traits were more important for success. Both groups believed the ability to follow directions and instructions was important for occupational success.

Hoggatt (1979) found that vocational business teachers rated skills such as shorthand, filing, and running duplicating machines as being more important, while employers and entry-level employees gave more emphasis to skills requiring decision-making or human relations skills. In indicating areas most in need of improvement for entry-level office workers, teachers listed the ability to follow suggestions and instructions; employers, the concern for productivity; and employees, the ability to write and speak effectively.

Wagley (1975) found significant differences between respondent groups (teachers of a nonfederally funded office practice course, teachers of a federally funded Cooperative Office Education course, employers, and beginning employees) about the degree of skill needed by beginning office workers.

Hargis (1978) found elementary and secondary administrators and secretaries to be in general agreement about the office and personal characteristics most important for school secretaries.

Combs (1974) found appearance and ability to get along with others characteristics deemed important by employers in hiring women in clerical, sales, operative, and service occupations. Respondents reported marital status as having little effect on a woman's chance for employment, and personal characteristics rather than technical skills as being the "single" most frequent reason for discharging women.

Wright (1973) used the technique of histrionism to determine to what extent physical attractiveness was considered a measure of employability by personnel directors in the selection of office workers. The data revealed that personnel directors preferred to hire the attractive, highly skilled applicant and considered attractiveness as equally important as skill accomplishment.

In synthesizing the judgments of supervisors on the importance of selected personal and work characteristics to task performance for business-office positions utilizing components of systems planning and controlling, Olney (1980) reported that accounting principles, analytical skills, human relations skills, and oral and written communication skills were important for entry-level task performance.

Madison (1969) identified the need for employees in office positions of a technological nature and the general characteristics of these positions; general characteristcs found to be common to office positions of a technological nature were related to age, education, and preemployment experience. The typical position required a mature individual with education beyond the high school level and related office work experience of at least three months. Two studies reviewed focused on the educational background of beginning office workers.

Karnes (1973) found that the curriculum pursued by high school graduates was a significant factor affecting their initial employment. The college preparatory curriculum appeared to be least effective in preparing high school graduates for initial employment. Doud (1970) found that the comprehensive high school played an important role in educating individuals for beginning office positions, while the public junior college played an important role in training individuals for business positions requiring a higher degree of training.

A number of studies focused on identifying tasks and/or competencies of office workers.

The NOBELS (New Office and Business Education Learning System) research project was undertaken to develop performance goals through the identification, classification, and analysis of job tasks basic to beginning and intermediate level office jobs (Lanham et al. 1972). Huffman et al. (1968) identified verbs to be used in describing competencies, providing the framework for later NOBELS studies. Lanham et al. used these verbs in interviews in which approximately five thousand office tasks were identified. Erickson (1971) classified types of tasks performed by beginning office workers into ten categories. Huffman and Gust (1970) extended the NOBELS study to determine emerging activities applicable to managers, clerical, supervisory, and professional-technical personnel.

Borcher and Joyner (1973b) conducted a task inventory analysis of occupational performance to determine the tasks performed by workers in the secretarial occupational area.

Baker et al. (1972) analyzed technical business occupations according to tasks, skills, and knowledge in the career clusters of records systems and control, secretarial science, and marketing.

Reed (1973) also identified job tasks for entry-level office occupations while Rencz (1978) analyzed tasks performed by low ability office workers.

Matthews (1975) found substantial differences in the competencies needed by entry-level office workers in small and large businesses.

Malina (1978) developed MODELS, a Modern Office and Distributive Education Learning System, which delineated basic work components or competencies essential to performing a basic task and total job. In identifying effective and ineffective task and social behavior, Malina found effective task behavior to be demonstrated by worker interest in, knowledge of, and understanding of the job and its function within the department. Effective social behavior was reported in terms of maturity and self-confidence. The findings supported the need for business education programs to emphasize individual and group interaction; access to computer terminals; short, varied learning activities; communication skills; information processing; and the integration of the high frequency components.

Burford (1978) studied how features of the office of the future were related to career paths of office workers. The data revealed that personnel who had beginning job titles classified by the researcher as technical/specialized had more level advances than did clerical persons. Burford also found personal traits and knowledge were perceived to be more important than skills for advancement opportunities. Clinkscale (1977) and researchers at Colorado State University (1973) examined the state of the office environment. The findings in all three studies indicated a trend toward automated office systems.

Lundberg (1975) identified and examined shifts in the perceptions of American office management specialists about clerical productivity for the period 1870 to 1970. In particular, shifts in management thinking about office human relations were determined through the development and assessment of theories of motivation.

Studies were reviewed that studied current office practices with implications for business education programs and/or courses.

Dohleman (1972) compared ratings of office managers, office employees, and secondary school office practice teachers on the importance of concepts pertaining to office work. While there was agreement among the three groups that a majority of the concepts were important to office work, office employees tended to place more value on concepts in the areas of business organization and systems and procedures than did teachers of office practice courses.

Hahn (1977) surveyed the chapter officers of the Administrative Management Society to identify characteristics of individuals currently employed in office administration and their needs for further growth and development. Hahn found there were significant differences between the personal characteristics of persons currently employed and the required characteristics for entering today's office at the administrative level. AMS chapter members rated as most important the need for college degrees in the areas of office administration and the area of office communications (written and oral).

Hall (1974) compared specific skill requirements of business firms with the content of college typing, office machines, and business mathematics courses. The data revealed that a disproportionately large amount of classroom time was being devoted to typing assignments such as tables, business letters, and manuscripts in comparison with employers' work demands. While fewer than 10 percent of the employers' calculating machines were rotary, one-half of the office machines course time was devoted to learning rotary calculator operations. While Hartley (1976) found course offerings were congruent with business requirements in several areas, the data revealed the need for more instruction in data processing and word processing and less emphasis on liquid, stencil, and offset duplication.

Royall (1979) sought to determine the relationship between current office practices of owner-managers of small, skilled service businesses and demographic items. The data revealed the following significant relationships: purchasing office equipment was positively related to educational level, and identifying a major office problem was positively related to the number of postsecondary courses taken pertaining to office management.

Mahaffey et al. (1969) ascertained the occupational skills and requirements needed by office employees due to changing technology and office procedures, with implications for secondary and postsecondary education and teacher preparation.

Research undertaken in Project BOOST (Business and Office Occupations Student Training) was designed to identify disadvantaged students' perceptions of office work, modify those perceptions preventing students from wanting to prepare for office occupations, and familiarize disadvantaged students with the procedures and skills needed for office employment.

Rothwell (1970) sought to determine whether personality traits, achievement on the National Business Entrance Stenographic Test, and the Visual Speed and Accuracy Test were predictors of job success. Analysis of the data led Rothwell to conclude that students who scored significantly higher on intelligence, emotional stability, or tender-mindedness, were more successful in their first jobs; students who scored significantly higher on the National Business Entrance Stenographic Test were also rated higher on job success.

Robon (1977) compared high school, two-year college, and four-year college vocational/technical/professional business graduates regarding their first full-time job and salary after graduation. A strong correlation was found between level of education and level of job secured, and between level of education and amount of salary earned.

Pearce (1978) investigated the supervisory effectiveness of first-level office supervisors as perceived by their superior and subordinates on three dimensions—people, work, and planning. Supervisory effectiveness scores were correlated with bioexperiential variables and personal affective factors.

Image of Business

Gehris (1980) found that a significant relationship generally existed between the following student characteristics and the work attitudes of the students as beginning office workers: participation in office simulations, business education concentration, and tardiness record. Gehris concluded that the work attitudes of beginning office workers could be predicted when considering the participation of business education students in office simulations and the tardiness record of business education students alone or in conjunction with any or all of the following student characteristics: scholastic achievement, business education concentration, race, size of the town or city residence, sex, and socioeconomic status.

Pitko (1971) found students' attitudes toward office employment were not affected by (1) instruction and participation in office education programs, (2) experience in communities, or (3) teacher attitude toward office employment.

However, Church (1973) concluded that a significant difference existed in perceptions of office environment overall between the four student groups (cooperative office experience, occupational model training, both occupational model training and cooperative office experience, and traditional office practice classes) and office employees. Cooperative office experience students agreed more closely with employees on office environment perceptions overall than did other groups.

Clanton (1975) found that secretaries in the Metro-Nashville School System generally have positive attitudes toward their jobs and conditions of work—with the exception of advancement and salary factors.

Barnes (1971) and McClendon (1974) compared attitudes of minority and nonminority high school students (in Fort Worth and Phoenix respectively) toward nonskill aspects of office work. Using the "Stuart Attitudes Toward Office Employment Scale," both Barnes and McClendon gathered data from a randomly selected ethnic-sex stratified group of Anglo, black, and Mexican American youth. Both Barnes and McClendon found that (1) regardless of the ethnic or sex variable, the business education students surveyed had "desirable" attitudes toward nonskill aspects of office work, and (2) both ethnic background and sex variables were determinants of how students viewed nonskill aspects of office work. McClendon found Fort Worth business education students to be more favorable toward nonskill aspects of office work than the Phoenix business education students.

Kashuba (1972) found that senior high school students' attitudes toward business were not significantly correlated with their level of occupational aspiration when compared by sex and intelligence. Significant differences were found when student attitudes were correlated with level of occupational aspiration by high school (socioeconomic area) and by high school pattern (academic, business, and general education). Kashuba found that students coming from a high socioeconomic area scored significantly higher on the business attitude questionnaire than did the other two groups. Those students enrolled in an academic pattern (college or university preparatory) scored significantly higher on the business attitude questionnaire than did business education students. A significant correlation between senior high school students' concepts of self and their level of occupational aspiration was found.

Blumenstein (1976) sought to determine the impact of the Singer Job Survival Skills (SJSS) program on the self-concepts and work attitudes of disadvantaged female youth. The SJSS program was found to be effective in improving work attitudes and self-concepts.

Job Satisfaction and Work Values

Several studies examined the job satisfaction of office workers.

Clemens (1978) investigated the relationships between degree of job satisfaction attained by clerical workers and each of the following variables: importance that clerical workers attach to job reinforcers and personality characteristics. Clemens concluded that a generally low level of satisfaction existed for the clerical workers surveyed.

In comparing the relationship between job satisfaction and sex among Certified Professional Secretaries (CPS), Sadoughi (1980) found that male CPSs were more satisfied than female CPSs in only one area of satisfaction, that of advancement.

Gerhart (1976) examined job satisfaction among three occupational levels (lawyers, social workers, and clerical workers) of white-collar women and the relationship of job satisfaction to some stresses and perceived strains experienced by these women. The findings indicated that the social workers were as satisfied with their jobs as the lawyers but that clerical workers were significantly less satisfied than either the social workers or the lawyers. The data revealed that job satisfaction was inversely correlated with job-related strain for all three occupational groups, with economic strain only for the clerical workers, and with psychosomatic strain only for the lawyers.

Dorsett (1976) determined levels of job satisfaction and job aspiration of black clerical government employees in order to determine if relationships existed between job satisfaction, job aspiration, demographic items, and skill satisfaction. The data revealed significant relationships between the following factors: level of skill satisfaction and each of the following—age, sex, length of service, and education; level of job aspiration and education; and level of job satisfaction and education.

Gilsrud (1972) related job satisfaction of Minnesota employees formerly classified as disadvantaged and job satisfactoriness to the job preparation given by their respective vocational office education programs. Schmidt (1980) examined the concept that extent of agreement between clerical employees and their respective supervisors on competency importance would relate to satisfactoriness and job satisfaction. The data revealed that a relationship existed between satisfactoriness and the extent of agreement on competency importance but that no relationship existed between job satisfaction and extent of agreement on competency importance.

In determining whether a significant relationship existed between black female workers' needs and work values and specific demographic characteristics, Ferguson (1976) found that the needs and work values differentiated black female workers in terms of selected demographic characteristics. Black female workers at varying age levels, varying occupational levels, and varying educational levels were found to have significantly different needs and values in the work situation.

Five studies were reviewed that investigated job satisfaction of word processing personnel. In examining the job satisfaction of correspondence and administrative secretaries, Reiff (1974) found that responses of correspondence and administrative secretaries to eighteen out of thirty-seven questionnaire items indicated favorable attitudes toward specific aspects of the word processing environment. Attitudes toward eighteen of the remaining items were neutral. Benjamin (1976) and Kutie (1977) examined job satisfaction among six groups of secretaries. In the Benjamin study, a greater deficiency of esteem needs was noted among correspondence secretaries than among administrative secretaries. Kutie (1977) found that word processing supervisors had the highest general satisfaction scores, followed by administrative support coordinators, word processing lead operators, and traditional secretaries. No significant differences in general job satisfaction were found. Job factors found to be most satisfying included variety, ability utilization, activity, and working conditions. Kutie concluded that secretaries generally feel satisfied when their abilities are being used and that activity and variety are characteristics of some word processing jobs.

Mitchell (1978) investigated the contributions of supervision and other selected factors to the job satisfaction of correspondence secretaries. Mitchell concluded that supervision of the word processing system was the factor having the most drastic influence on the level of job satisfaction of correspondence secretaries. Many other factors influencing satisfaction were found to be controlled by supervision.

Casady (1973) determined that significant relationships did not exist between job satisfaction of magnetic typewriter operators and each of the following variables: employee and job characteristics, English and spelling skills, and vocational needs. Magnetic typewriter operators surveyed were most satisfied with their pay, the volume of work, and relations with coworkers; they were least satisfied with their opportunities to do things for other people.

In analyzing employed secretaries' perceptions of the secretarial occupation, Bousley (1977) found a strong relationship between role image and role behavior. While job satisfaction was significantly correlated with role image and role behavior, the relationship was weak. Bousley found job satisfaction to be statistically significant with one independent variable, supervision, which was in agreement with Mitchell's findings. However, Simon (1972) found supervision as well as the possibility of growth and factors of personal life and job security to have a negligible effect on job satisfaction or dissatisfaction of school secretaries. Simon found the five most important factors relating to school secretary job satisfaction were recognition, achievement, interpersonal relations—peers and pupils, and work itself. The five most important factors found to lead to secretary job dissatisfaction were working conditions, achievement, interpersonal relations—principal/ supervisor, and interpersonal relations-pupils and peers. Generally, the same factors appeared to operate as satisfiers and as dissatisfiers for secretaries, which is contrary to industry findings.

Four studies investigated the work values of clerical employees and/or clerical students using Super's *Work Values Inventory* (1970). Kuiper (1976) investigated values of clerical workers, Hamed et al. (1977) measured values of clerical students, and Searfoss (1975) and Vunderink (1979) compared values of clerical students and clerical workers.

In synthesizing the findings of these studies, Kuiper and Vunderink (1980) found that supervisory relations, economic returns, achievement, and way of life were the dominant values among clerical employees and that the management value was consistently ranked low by clerical workers and students. The work value way of life was ranked the highest by the clerical students, followed by achievement, with supervisory relations ranked third through fifth. Kuiper and Vunderink concluded that management cannot rely on one type of reward system, given the findings that the values structures of clerical employees and students include both intrinsics and extrinsics. In addition, educators and office administrators should evaluate the motivating techniques they employ in light of the findings that clerical employees and students did not place the use of managerial skills high in their work values hierarchies.

Other studies reviewed that investigated values and/or needs of students included studies by Elliott (1969), Fitzgerald (1974), Cortelyou (1978), Miller (1977), and Church (1978).

In comparing values held by business education students, business administration students, social science students, secondary business teachers, and businesspeople, Elliott (1969) found businesspeople to be the most conservative group while the social science students were the most liberal of the five groups. Business education and business administration students showed moderately conservative value orientations.

Fitzgerald (1974) found business teachers and business teacher education faculty and students most likely to accept and perpetuate society's norms when assessing differences on six value criteria (divine fate control, need for structure order, need to help people, need for people, interpersonal aggression, and general pessimism) among the following groups: businesspeople, business administration teachers, business teacher education teachers, business administration students, and business teacher education students.

In comparing value systems of executives and secretaries, Cortelyou (1978) found the value priorities of executives and secretaries to be similar. They most frequently ranked the terminal value of family security as first and most frequently ranked the terminal values of national security and salvation as last. They most frequently ranked the instrumental values of being honest and obedient as first and last. However, the executives ranked high the value of being logical, while the secretaries ranked it low.

Miller (1977) compared work values of students enrolled in three different methods of instruction in office occupations: cooperative, office simulation, and traditional. Miller concluded that the type of office education program followed made little difference in terms of work values acquired by the students.

In comparing needs, aspirations, and perceptions of office personnel, high school students, and teachers, Church (1978) found significant differences between office employees and business education students with or without simulated office experience, while students having both simulated office experience and cooperative office experience differed least of the student groups from employees.

Sexism and Sex Equity

Three studies investigated characteristics and/or attitudes of women in achieving their status in business, government, and/or education. Adams (1975) found that women executives felt they had to work harder to achieve their successes, and that men were more helpful than women in terms of career advancement. The successful women tended to be mature (in their forties or fifties), in traditional occupations, and had unusually high educational levels.

The characteristics of women in business were also investigated by Weber (1978). Holtz (1979) studied the characteristics of women in government and education as well as in business. Significant differences in personality traits were found among the three groups of women administrators in the Holtz study. Sex discrimination was a barrier experienced by all three groups, with businesswomen indicating it to be a more common problem. The factor of education was considered most important by educators for career success, and mentors and exhibiting "male" behavior were factors considered most important by government administrators.

Weber (1978) investigated the relationship between the formal education and career histories of women managers in Canadian firms. When data from the women managers were compared with data of the general labor force, the women managers had a lower marriage rate, a higher divorce rate, and a higher education level. The study sample held positions in the middle and lower categories of management.

Patrick (1979) concluded that women have made progress in achieving managerial positions in the communications and banking industries, which have come under government scrutiny; however, women did not appear to have made significant inroads into the upper levels of management.

Hewitt (1975) did a comparative study of male and female faculty members in departments of business education affiliated with the National Association for Business Teacher Education (NABTE) in order to determine the status of women faculty in departments of business education. Significant differences resulted between male and female members of NABTE institutions. The women faculty members held lower rank, earned less, were single, widowed, or divorced, and wrote less than their male colleagues.

Etherington (1977) developed profiles of community college women students making traditional (secretarial) and nontraditional business (business administration, transfer, and accounting) curricula choices. Etherington found women making nontraditional career choices to be older, to have higher levels of educational aspiration, higher college grade point averages, and a higher need to achieve, and to possess a number of personality traits in common with men in general. Etherington concluded that the profile of women making nontraditional business curricula choices indicated that women possess characteristics associated with success in traditionally male occupations.

Petersen (1976) studied the work aspirations of Oregon community college freshman women enrolled in office occupations curricula. Petersen found age, marital status, desire for independence, desire for self-fulfillment, and a desire to be self-supporting to be important determinants of the career aspirations of these women.

Sullivan (1977) investigated the career aspirations and employment status of university graduates with a secretarial specialization between 1955 and 1975 inclusive. Sullivan concluded that the office administration major provided a distinct advantage for women in obtaining a high-level secretarial position, and that opportunities to advance into nonsecretarial positions were limited once established in the secretarial role. Few of the office administration majors obtained middle-management positions. The majority of office administration majors who acquired aspirations to move into management positions did so after graduation. The office administration major did not provide the best insurance for advancement in the business world for women who aspired to move beyond the secretarial level into management positions. Those who graduated after 1965 appeared to give greater value to their business administration background than their secretarial background and to express greater disillusionment with the stereotypes of the secretarial field.

Hersh (1978) sought to determine if the image of employed women found in modern fiction was consistent with recent changes in occupation and status of American women. In examining books that appeared on *The New York Review*, "Best Seller List—Fiction" during 1974, Hersh found women to be underrepresented, in total numbers and in the percentage who were employed. Few employed women put work before personal relationships. The occupations most frequently represented were secretaries, maids, nurses, and sales workers. Hersh concluded that the novels reviewed projected an inaccurate image of the changing role of women in society by underrepresenting women and employed women. He also reflected on how society has viewed women in a male-dominated culture.

Sumner (1977) analyzed the portrayal of women in business in popular novels between 1890 and 1950 in terms of background, achievement in their vocations, attitudes toward their vocations and marriage, attitudes of their coworkers, husbands, families, and attitudes of members of the community. Sumner found in each period of the study that some women were content to conform to expectations of others for their behavior; those not content to conform to expectations of others experienced conflict. Sumner concluded that the socialization process has passed on attitudes that may limit women's career aspirations.

Davies (1979) investigated when and how changes took place in the organization of clerical work in the United States during the period 1870-1930 and the relationship between these changes and the feminization of the work force. Davies concluded the degradation of low-level clerical work was a process disguised by the feminization of clerical work, since women were thought to be neither serious nor long-term employees of the labor force and, therefore, suitable for low-level clerical work.

In investigating high school sophomore students' attitudes toward women's roles and nontraditional vocational career choices, Walch (1980) found attitudes differed based on the following student background characteristics: sex, religious commitment, location of family residence, mother's employment status, and social class.

Arnold (1974) investigated the attitudes of high school business teachers, high school business students, and parents of female business students toward the social, educational, and economic role of women in society today. Arnold found that attitudes of the respondents were significantly related to their sex and to the position of status they held. Female respondents were more favorable toward women's role in society than male respondents. Teachers had the highest mean scores, followed by students and parents.

An in-depth investigation of clerical workers in Connecticut (1978) revealed that there was sex discrimination in the field and concluded that most of the discrimination was systemic. Key causes identified were the sex stereotypes surrounding the role of clerical workers, the oversupply of women in the labor force, and unwillingness to promote persons in this line of work.

Waters (1976) and Stiller (1979) developed profiles of women in office positions in universities and public schools, respectively.

In determining the relationship between aptitude, academic achievement, previous education, chronological age, racial/ethnic origin, and rural/urban background to success in an office occupations education program for disadvantaged adolescent women, Brown (1973) found successful program graduates had a significantly higher level of formal education and were significantly older.

Wilson (1979) compared women employed in clerical positions who indicated a decision to seek a voluntary career change by making application to Stride, a formal career change program, with women who had never applied for such a program. Wilson found those women who had indicated a decision to apply (Appliers) were more aspiring, younger, and had attained significantly more formal education than their nonapplying peers. Wilson concluded that Appliers had a long-standing aspiration deriving at least from high school, and that high aspiration was a critical ingredient for women clerical workers seeking formal career change.

The National Council of Negro Women (1975) completed a project developing career ladders in clerical occupations through data gathered from major corporations.

Image of Business Education

Studies investigating attitudes toward business education examined attitudes of various groups at several levels.

Manning (1972) investigated the attitudes of secondary school faculty and students toward business education. Manning found that secondary students and faculty differed significantly in their opinions about business education; students were more positive.

Senior high students perceived business education as having a significantly higher value when compared to four other major subject areas (Needles 1975).

Romero (1976) investigated perceptions of vocational business students about several dimensions of classroom environment.

In comparing the perceptions of two groups of students about the instructional climate of their programs (one group enrolled in public school clerical and office training programs and one group enrolled in nonpublic school clerical and office training programs), Warner (1974) concluded that one should consider alternative vocational training programs for credit as options for dropouts and potential dropouts.

Schoenike (1974) compared attitudes of office and industrial students and employed graduates toward the job training they experienced. The data indicated that attitude toward job training remained unchanged for at least a year after graduation for graduates employed full-time. Students and employed graduates held higher attitude values toward job training areas related to occupational skills and knowledge than toward training related to occupational work habits and work relationships.

Two studies reviewed focused on attitudes toward business education among college students. Myers (1970) found positive attitudes toward secondary business education among the college students. Williams (1976) found that generally administrators and students were similar in their responses, while faculty differed in their responses.

Blair (1977) focused on attitudes of business personnel toward high school business education. Although Blair concluded there was a strong belief among the business personnel that business educational programs were worthwhile, higher attitude mean scores resulted for the Clerical program, the Cooperative Education program, and the Stenographic/Secretarial program than for the Accounting/Data Processing program and the Preprofessional program.

Bondokji (1974) studied the development and growth of the general secondary school and the secondary commercial school, Jordanian economic activities, and attitudes of business managers about the relevance of the secondary commercial school curriculum.

Rowell (1975) sought to determine the relationship between selected ideal business education classroom practices as perceived by business education leaders and actual classroom practices as perceived by business education teachers of New Hampshire.

When the perceptions of Arizona on-the-job training supervisors, coordinators, and principals of the purposes and objectives of cooperative business education programs were compared, Soutter (1971) found the three groups' perceptions differed significantly on twenty-two of the fifty-one statements in the survey instrument. Fackler (1977) found that cooperative-work-experience students perceived themselves as slightly more mature but less confident than students without the cooperative-work-experience.

Houstman (1972) compared perceptions of state office education and distributive education supervisors and office education teacher educators about the future of vocational office and distributive education.

Robbins (1978) reported on the status of business education in the public high schools of Oklahoma.

Crawford (1975) and Gandy (1970) studied public relations practices and procedures of business education departments in public junior colleges and secondary schools, respectively. Ertel (1974) analyzed business and office education teacher contacts with business, industry, and government.

Training in Business

Training and educational activities of businesses throughout the United States (Olsen 1975), within a regional area (Blackman 1978), and within a state (Brender 1973; Castellucis 1976; Huston 1976; Johnson County Community College 1978; Rosentreter 1977; and Troman 1979) have been investigated. The general conclusion reached was the need for a liaison between business and education to keep both aware of the training being conducted for students and employees in order to develop integrative programs.

Business and industry representatives indicated they will need to offer business education programs in the following areas in the next ten years: human resource management, economic understanding of the work place, communications, and data handling.

Both Troman (1979) and Huston (1976) found a need to develop methods and programs for evaluating the effectiveness of training practices within business. Both Troman and Olsen concluded that employers were generally not satisfied with the preparation of students for the work situation.

Rosentreter (1977) evaluated a management training program using four measures of desired program outcomes: employee turnover, employee lateness, managerial performance ratings, and the number of written employee grievances. Using an experimental design, Rosentreter found the management training program was effective in changing an organizational variable, employee turnover, that contributed to the company profits.

Castellucis (1976) found in-house training to be preferred when investigating educational programs and requirements of Oklahoma businesses. Companies did not appear willing to assist a community college or technical school in establishing training programs for employees.

Brender (1973) analyzed selected inservice training programs for nonmanagement office personnel and used the data gathered in preparing and testing an inservice skill training program in Business English Review and Letter-Writing Principles. Brender concluded that the majority of firms did not conduct inservice classroom training for nonmanagement office personnel but rather conducted skill training on the job.

A survey was completed to determine areas in which Johnson County, Kansas (1978), businesses wanted their employees to obtain instruction.

Curtis (1976) and Swatt (1972) reported on continuing education opportunities for business employees. Swatt investigated adult business education offerings in the public evening school. Curtis investigated the practices used by business organizations for recognizing employee achievements. Employees generally tended to have a low rate of participation in continuing education activities not leading to a college degree.

Keester (1970) investigated clerical vocational training in the United States Army and determined to what extent this training was used by separated personnel.

Summary

A variety of topics under the heading of social and business environment was researched: office technology/careers (33.9 percent or forty studies), image of business (6.8 percent or eight studies), job satisfaction and work values (18.6 percent or twenty-two studies), sexism and sex equity (17.0 percent or twenty studies), image of business education (14.4 percent or seventeen studies), and training in business and education (9.3 percent or eleven studies).

Over 77 percent or ninety-one of the studies reported on data gathered in business settings, from employers, employees, and/or supervisors. Twenty-five percent or thirty of the studies included students, whereas 12.7 percent or fifteen of the studies included teachers. Documents were the source of data in eight (6.8 percent) of the studies.

The most common research methodology employed was descriptive data analysis (48.3 percent or fifty-seven studies) followed by mailed questionnaire (27.9 percent or thirty-three studies).

Most of the studies within the area of social and business environment were concerned with developing a better understanding of the office environment in which people work. The changing nature and climate of office systems make it imperative that researchers continually study this area in order to provide guidance to business educators in planning programs and curricula to meet the needs of workers and society.

The encouragement of extensions of existing research will further the development of new knowledge at a more rapid rate and expand the researcher's ability to conduct futures studies.

CAREER EDUCATION/CAREERS

Although a substantial body of knowledge exists through studies completed in career education in general, the majority of the research reviewed in this work focused on both career education/careers and business education or business. A total of seventeen doctoral dissertations or independent studies was reviewed.

More than 80 percent (fourteen) of the studies reported on data from one state. Two of the studies (11.8 percent) reported on data gathered from national samples. One study aggregated data from several states. Three of the studies employed experimental research methodology, whereas fourteen of the studies used descriptive survey methods.

Research Methodology	Number	Percentage
Experimental	3	17.7
Descriptive Test Data Analysis	8	47.1
Mailed Questionnaire	3	17.7
Observations/Interview	3	17.7
TOTAL	17	100.2

Approximately one-third (35.3 percent or six) of the studies included the use of secondary school students or educators. Two (11.8 percent) of the studies reported on data gathered in community college settings from teachers, counselors, and students or deans. Six (35.3 percent) of the studies included data gathered from personnel within business firms. Two (11.8 percent) studies reported on data gathered from university students. Three additional studies collected data from sixth grade, eighth grade, and university business teacher educators, respectively.

A variety of dimensions of career education was researched: status of career education and business involvement in career education (23.5 percent or four studies); attitudes toward career education (35.3 percent or six studies); career concerns, development, and aspirations (29.4 percent or five studies); and instructional strategies (11.8 percent or two studies).

Status of Career Education and Business Involvement

Calhoun (1980) reported on the status and need for career education in business programs. Approximately one-half of the respondents (members of the National Business Education Association, NBEA) worked in schools and/or school districts where career education programs existed. Seventy-five percent of the respondents indicated they integrated career education into business education on a daily or weekly basis. Respondents most often indicated the following variables as barriers to increasing the amount of time devoted to career education: lack of money, amount of instructional time, and low priority of career education integration. Respondents indicated a desire for information on instructional materials and teaching techniques and preferred state education agencies, NBEA, and local school districts as sources of career education information.

A career pattern for hospital office personnel was developed by Harvell (1974) to assist business educators in relating vocational training more closely to job requirements.

Campbell (1976) and Owens (1979) focused on determining current and desired levels of business involvement in career education. In addition, Campbell (1976) determined the relationship between selected characteristics of firms and the perceptions of the firms' business personnel about current and desired levels of cooperation between business, industry, and education. The findings indicated that those firms more involved in career education had the following characteristics: suburban area location rather than city, membership in the local chamber of commerce, a public relations department, an education division, membership in a trade or professional association, and an employee training division.

Attitudes Toward Career Education

Three studies were reviewed assessing attitudes toward career education. Grant (1979) investigated attitudes of students, parents, educators, and business leaders toward selected concepts of career education. Leddy (1975) focused on determining the attitudes of Guam public school teachers (permanent and nonpermanent resident teachers) and island business managers toward the work concept of career education, comparing their attitudes and degree of dogmatism. Both Grant and Leddy concluded that the groups surveyed in the respective studies were supportive of having the work concept implemented in the school systems. Leddy concluded that the three groups differed significantly in their attitudes toward several of the work concept items, and business managers were significantly more dogmatic than all teachers.

In comparing attitudes toward career education concepts of superintendents, principals, and teachers who participated in the Iowa Career Education Project (ICEP) with attitudes of nonparticipants (non-ICEP), Schmadeka (1976) found the participants of the ICEP Project had a more positive attitude on all of the concepts judged.

Some research focused on guidance and counseling practices and business education. Billett (1972) analyzed the viewpoints of counselors, teachers, and students about guidance and counseling services for vocational office occupations programs but Duncan (1978) assessed perceptions of vocational business teachers and guidance counselors about the nature and extent of their involvement in providing career planning and placement information and skills.

Duncan found vocational business teachers more involved than guidance counselors in providing career information, self placement skills, and placement activities.

Ellis (1972) compared differences in attitudes of academic deans, guidance personnel, and business educators in community colleges toward guidance functions. Ellis found significant differences in attitudes toward consultative, regulatory, service, and organizational functions. The general conclusion reached by the researchers was the need for identifying responsibilities of the guidance discipline that could be shared by business teachers and guidance counselors and exerting cooperative efforts in the areas identified.

Career Concerns, Development, and Aspirations

In determining factors influencing the career choice of high school business and office students, Bauman (1975) found a high statistical relationship between education and occupational aspirations. A moderate statistical relationship was found between occupational

aspirations and the extent of knowledge of expected occupations. High school academic records and student leadership ability were significantly related to career choice. Mothers were found to be the most important influence on their children in educational and occupational decisions. Guidance counselors and business teachers were ranked highest of school personnel in influencing student career choices. Bauman concluded that the students make more educational choices than occupational choices; 83.1 percent were certain of their vocational aspirations while 93 percent were sure of their educational aspirations.

Knezek (1972) identified and analyzed perceptions of students, business teachers, and counselors in community junior colleges about the kinds of information needed in community junior colleges regarding career opportunities. Knezek concluded that guidance about career opportunities was inadequate in community junior colleges.

Cowan (1979) investigated the effect of goal setting on the career maturity and classroom performance of business college women enrolled in business communications differing in locus of control. Three sophomore business communications groups were randomly assigned to the following treatments: (1) the task of writing resumes, (2) the task of writing resumes with a goal-setting emphasis, and (3) no treatment. No significant differences resulted between resumes written by the goal-setting group and resumes written by the group exposed to standard resume writing and between resumes written by internals and externals. Cowan found positive significant correlations between measures of locus of control and measures of career maturity.

Goodrich (1975) compared career expectations of university senior women students majoring in office administration with career opportunities for university women office administration major graduates as reported by selected business administrators. The general conclusion drawn from the findings was that the career expectations of office administration majors were not the same as the career opportunities for office administration graduates. Business administrators indicated the degree would have little influence on the entry-level position of an office administration graduate. Students thought more emphasis should be placed on business management and communications in college.

Phillips (1977) described the career development of women managers and executives in American business and industry. In particular, the study focused upon determining the effect that significant others had on the careers of women; i.e., the concept of "career mentoring." Five factors were indicated as being most helpful to these women's career success: being competent, having strong drive and determination, gaining knowledge in school and other courses, having good personalities, and being sponsored or groomed by another person. Career obstacles included employer discrimination, coworker resentment, and the personal feeling of the women that they needed more academic degrees or credentials. Sixty-one percent of the women indicated they had had one or more career mentors during their lifetimes. Phillips concluded that mentoring is one valuable component of an overall career development program.

Instructional Strategies

The posttest-only control group design was used by Ahern (1974) in comparing the effectiveness and cost of the microform medium and the hard copy medium in presenting career information on business and office occupations to rural sixth grade students. Thirty-six sixth grade classes were randomly selected and assigned to the experimental treatments: (1) microfilm career presentation, (2) hard copy career presentation, and (3) no career presentation. Students exposed to the microform presentation recalled more career information than those students

exposed to the hard copy presentation. Ahern also found significant differences in the amount of career information recalled when comparing the group exposed to the hard copy presentation with those not exposed to any treatment, in favor of the hard copy presentation.

Charles (1975) developed and investigated the effects of a planned Career Education Career Development Instructional Program taught by business and office education teachers at the eighth grade level. Charles concluded from the findings that the null hypothesis of no significant difference in the group scores of the experimental and control groups, based on student responses on the pre-test and post-test, could not be rejected.

However, a significant difference resulted in the attitudes of students and teachers toward the program and strategies of teaching and implementation, in favor of the experimental treatment. Charles concluded that short-term projects in career development produced "minimal noticeable results" and that career development is a developmental process that should begin in the early years of life and continue throughout life.

Summary

With the changing nature of the office environment and, thus, the changing roles of workers in business, the content to be included in developing units of instruction for integrating career education into existing classes needs to be continually researched to reflect the changing career opportunities of workers in business.

In addition, the need exists for research on instructional strategies for imparting career education concepts throughout all business education classes.

PROFESSIONAL ORGANIZATIONS

Eleven studies were concerned with professional organizations. Three involved professional organizations for business educators, seven for students, and one for secretaries.

The studies involved four research methods as follows:

Research Methodology	Number	Percentage
Questionnaire	6	54.55
Descriptive Test Data Analysis	2	18.18
Materials Analysis	2	18.18
Case	1	9.09
TOTAL	11	100.00

Teacher Organizations

Bieber (1978), Carr (1978), and Perry (1979) investigated problems related to teacher organizations. Bieber compared personal, professional, and job-related characteristics of women and men business education faculty members of National Association for Business Teacher Education (NABTE) Institutions in the Western Region of the National Business Education Association (NBEA). Of the forty-three characteristics studied, fourteen differed significantly between male and female business educators.

A survey study by Carr evaluated the functioning of the Illinois Consumer Education Association (ICEA) to identify strengths and weaknesses and to recommend action to further its growth.

Perry studied the recruitment practices of state NBEA membership directors to determine which ones had been most successful in increasing NBEA membership from 1973-1977. Ten recruitment practices common to all states were identified. Perry found that six practices were significantly correlated with increases in NBEA membership.

Student Organizations

Five of the student organization studies were concerned with Phi Beta Lambda (PBL) and/or Future Business Leaders of America (FBLA). Robbins (1977) and D'Abrosca (1978) studied the relationship of membership in PBL and/or FBLA and selected student characteristics. Robbins concluded that business education students who were members of FBLA scored significantly higher on tests of career maturity than did nonmember business education students. D'Abrosca concluded that FBLA competitive event winners possessed a higherdegree of leadership characteristics as rated by their employers than did students who were not members of FBLA.

Ryan (1975) surveyed members of the National Federation of Independent Business to determine whether or not the national FBLA-PBL team and individual events are measuring the areas of competency needed for entry-level positions in office occupations in small business.

McCauley (1980) studied the effect of a training module on advisors' ability to plan, organize, establish, and operate FBLA-PBL chapters.

Siebert (1975) identified the characteristics that have a high correlation with the attainment of objectives in FBLA, Distributive Education Clubs of America (DECA), and Future Farmers of America (FFA).

Two descriptive studies dealt with the Office Education Association (OEA). Williams (1980) reported on the relationship of employers' hiring preferences and students' experiences in OEA. McKenzie (1977) identified the merits of student participation in OEA as reported by advisors and employers.

Secretarial Organizations

Willey (1977) did a case study of a National Secretaries Association chapter. She described the impact of the chapter activities on members, business education programs, and business administrators.

Summary

Professional organizations do not appear to have received a great deal of attention from researchers to date. A large number of studies concerned the effect membership in student organizations has on characteristics such as later career maturity, development of competency, and attainment of training/experiential objectives.

Receiving a secondary amount of attention have been several issues concerning membership in teacher organizations. Concerns have ranged from individual characteristics of members to efficacy and recruitment issues.

Finally, the least researched area has been membership in organizations specific to a particular profession; in this case, the secretarial profession. This area is deserving of more research as membership in this type of organization should be reviewed in a different light from those educationally oriented affiliations.

BOOKKEEPING AND ACCOUNTING

A total of ninety-nine doctoral dissertation or independent studies has been identified in the area of bookkeeping and accounting. The predominant topic for investigation concerned the effect of teaching methodology on achievement in bookkeeping and accounting. Forty-one studies (41 percent) dealt with instructional strategies. Evaluation of students, teachers, courses, programs or other phases of bookkeeping and accounting followed closely with thirty-four research reports (34 percent). Questions concerning the content for bookkeeping and accounting programs were investigated by nineteen researchers (19 percent), and objectives for bookkeeping and accounting courses or programs were investigated by five (5 percent).

The research in bookkeeping and accounting was directed toward or had implications at the secondary, postsecondary (vocational-technical schools, community colleges, and junior colleges), and collegiate (four-year, masters, or doctoral programs) levels. The level of accounting receiving the most attention was the four-year college program having forty-four studies or 44 percent. The two-year college programs had twenty-seven studies or 27 percent. High school bookkeeping and accounting received the attention of thirteen studies of 13 percent. The remaining studies (fifteen or 15 percent) were directed toward all educational levels.

The types of research were rather evenly divided among experimental design, mailed questionnaire, and descriptive tests. The following summarizes the types of research practices used:

Research Methodology	Number	Percentage
Experimental	30	30.2
Descriptive Test Data Analysis	30	30.2
Mailed Questionnaire	24	24.2
Material Analysis	6	6.1
Materials Development	4	4.1
Personal Interview or Observation	4	4.1
Q-Sort	1	1.1
TOTAL	99	100.00

The following sections summarize the research in the areas of objectives, content, instructional strategies, and evaluation.

Objectives

Of the five studies dealing with objectives, four involved the development of behavioral objectives for specific courses. The other one identified objectives for the total undergraduate accounting education program. Petro (1969), Uddin (1977), Anderson (1978), and Shook (1979) developed sets of behavioral objectives for accounting. Petro used the set of objectives to design learning structures for instructional programs in accounting. Uddin used the set of behavioral objectives to compare the opinions of secondary, two-year college, and four-year college accounting instructors concerning the objectives and methods used for teaching elementary accounting. Anderson used his set of behavioral objectives to develop tests for measuring the

objectives. Shook used his set of objectives to identify commonality and differences in academic preparation and accounting practices.

Solomon (1972) identified and compared the perceptions of accounting practitioners and accounting educators concerning the objectives for undergraduate accounting education programs.

Content

Identification of content for bookkeeping and accounting courses was the focal point in eighteen studies. The researchers used different approaches to determine what the content is or ought to be. These included the analysis of (1) accounting job tasks or competencies, (2) new technology applications, (3) opinions of accounting teachers, (4) opinions of accounting practitioners, (5) accounting textbooks, and (6) professional literature and research reports.

Kelly (1970), Moon (1970), Donnel (1976), Harris (1975), Reap (1976), and Jenkins (1980) analyzed bookkeeping and accounting tasks to determine the competencies needed in order to identify content for courses. Harris and Kelly studied semiprofessional accounting positions. Donnel, Jenkins, and Reap analyzed entry-level jobs. Moon investigated the duties of full-charge bookkeepers.

Concern about the impact of data processing on bookkeeping and accounting practices was evident in the research. Eight studies used widely divergent approaches to identify the skills and concepts that should be incorporated as content into bookkeeping and accounting. Stelter (1968), West (1973), Schillak (1975), Verschoor (1977), Skudrna (1978), and White (1978) analyzed different levels of bookkeeping and accounting jobs to determine the data processing concepts and skills used to perform the duties. Reardon (1971) identified reasons given for excluding electronic data processing content in accounting courses. Kodet (1968) gives a historical perspective of the evolution of mechanical equipment for processing financial information.

Walcher (1970) used the opinions of accounting instructors in junior colleges and Hilgar (1974) used the opinions of both college accounting instructors and businesspeople to assess the importance of electronic accounting concepts.

Kaliski (1974) developed an outline of topics for a two-year college elementary accounting textbook by merging a list of topics found in ten widely used elementary accounting textbooks with the topics listed in the Price-Waterhouse study and having a panel of fifty accounting educators evaluate the importance of each topic.

Willis (1976) identified difficult topics in high school bookkeeping.

Listro (1976) identified accounting principles that are unique to nonprofit organizations and determined their status in college accounting courses.

Instructional Strategies

Computer-assisted instruction (CAI), individualized or self-paced instruction, programmed instruction, and audio/visual/video tutorial instruction were the most frequently investigated

teaching methods. Of the forty-one studies related to instructional strategies, nine were concerned with computer-assisted instruction, ten with individualized instruction, nine with programmed instruction, and eight with audio/visual/video tutorial instruction. Other teaching methods evaluated included student-oriented versus teacher-oriented methods, homework procedures, and the use of instructional aids. C. L. Smith (1975) did a comparative study of the reading level of selected high school, vocational, and college accounting textbooks. Stearns (1969) investigated the effect of class size on achievement in accounting.

The major question regarding computer-assisted instruction was its effect on achievement in accounting. Of the six studies concerned with the relationship between CAI and achievement, the findings in five revealed that CAI is not superior to traditional methods of instruction in accounting. Arnett (1976), Baxter (1974), and Saul (1974) reported no significant difference between the control and experimental groups. Knerr (1976) and Johnson (1977) found that the control groups taught by the traditional method had higher achievement than did the CAI groups. Hong (1972) indicated that the CAI group performed as well as the control group. Only Friedman (1978) found that CAI resulted in superior achievement. Solomon (1974) found that CAI reduces the time needed to complete accounting instruction. Walker (1978) developed computer-stored programs to assist students in working textbook problems. He concluded that computer-assisted instruction is both feasible and practical. CAI was recommended in many of the studies because of improved efficiency in teaching and learning and because students and teachers tended to enjoy using it.

The question in ten studies concerned the effectiveness of individualized instruction or self-paced study. The treatments varied widely. The common aspect in all of the studies was that the students were given self-paced instructions or learning packets as a means of individualizing instruction. Humbarger (1968), Elliott (1972), Reno (1972), Elsea (1973), Brown (1976), Goodnow (1980), and Echord (1980) found no significant difference in achievement between individualized instruction and traditional methods. Battista (1977) reported higher achievement for students taught accounting by traditional methods. Lee (1976), however, found that students taught using the Personalized System of Instruction did have higher achievement than did those in the control group. Graham (1975) concluded that students could attain the mastery level of achievement using individualized instruction. All but one study involved collegiate accounting courses; Humbarger's study was conducted with high school students.

Nine studies investigated the use of programmed instruction. These included Butts (1969), Daily (1969), Cloud (1970), Will (1970), Glover (1971), Orefice (1971), Humphrey (1971), Hong (1972), and Brooke (1974). All except Hong found that students taught with programmed instruction did not achieve significantly better in accounting than did those taught in the traditional manner. All of the studies were conducted at the collegiate level.

The relationship between sensory modality and achievement in accounting concerned several researchers. Butts (1969) and Flanagan (1970) varied the mode of presentation by using the audiotutorial approach. Both found the use of tapes to be as effective as, but not superior to, the traditional lecture-discussion-problem approach. Stewart (1977) and Carbone (1976) used audiovisual materials in their treatments for the experimental groups. Vignone (1977) used audio materials in one experimental group and visuals in another. Bowman (1977) used video tapes. None found audio/visual/video tutorial approaches were more effective than traditional methods. Several reported that students and teachers enjoyed the presentations better than the traditional lecture-discussion-problem presentations.

The impact of visual aids was studied by Madsen (1969) and Boley (1976). Madsen studied the effect of transparencies on achievement; Boley studied the effect of flow charts on achievement.

Wunsch (1969) tested three uses of study guides as teaching devices. He reported conditions under which guides can be used effectively as testing devices, learning devices, or as both in high school bookkeeping classes.

Questions concerning homework were investigated in two research studies. Dye (1973) compared achievement of beginning accounting students in classes where homework was assigned with achievement in classes where no homework was assigned. Amyx (1972) studied the effects of short homework problems versus long homework problems on achievement and attitudes of college accounting students.

Shannon (1971) and Hopf (1976) did comparative studies to determine the effects of student-oriented approaches as opposed to teacher-oriented approaches on student achievement in introductory bookkeeping and accounting classes. Shannon experimented at the high school level and Hopf at the collegiate level. The findings were similar. Neither approach proved to be superior. Each approach had positive and negative aspects identified in the studies.

Evaluation

A total of thirty-four doctoral research reports in the bookkeeping and accounting area was evaluative in nature. Aspects of bookkeeping and accounting evaluated included issues in teaching high school bookkeeping, importance of the high school bookkeeping course as background for the elementary college accounting course, teacher competencies needed for teaching accounting, factors that predict successful achievement in bookkeeping and accounting classes, factors that predict job success, and characteristics of students enrolled in accounting classes and programs of instruction.

Stirewalt (1970) identified fifty-three issues in the teaching of high school bookkeeping and surveyed the opinions of high school bookkeeping teachers, college bookkeeping methods teachers, state and local supervisors, and bookkeeping textbook authors. Stirewalt reported that there was a majority of agreement on roughly one-half of the issues.

The importance of high school bookkeeping as a background course for college accounting was the central question in four doctoral studies. The conclusions in the four reports differed widely. Smith (1968) concluded that there is a significant difference between the achievement in college accounting of students who have studied high school bookkeeping and those who have not and that the students who have studied bookkeeping can successfully complete college elementary accounting in substantially less time than that required for those who have not studied it. Sink (1968) investigated the importance of high school bookkeeping to college accounting courses that used three different approaches: corporate programmed, managerial, and traditional. He concluded that students who have completed high school bookkeeping achieved at approximately the same level in first-term college accounting regardless of the approach used and that students who have not studied high school bookkeeping are as likely to complete first-term accounting as are students who have not studied bookkeeping. Jacoby (1975) reported that the reverse was true in the later stages of the course. Herlong (1974) found no significant difference between the achievement in college elementary accounting of those students who have studied high school bookkeeping and those who had not had the course.

Using characteristics of the student to predict successful completion of accounting courses was the concern of fourteen investigators. Groft (1978), Beavers (1974), and Rhile (1972) studied the effect of being a native student as opposed to being a transfer student on achievement in college accounting courses. Flam (1973) studied the effect of being a minority student versus a

nonminority student on achievement in high school bookkeeping. Webb (1971), Hilman (1972), Swink (1972), Bryan (1973), Pietron (1979), and Gorham (1980) studied variables found in various standardized tests as predictors of achievement in bookkeeping and accounting. Webb and Pietron identified prognostic variables for high school courses and the others identified variables for collegiate programs.

Six studies evaluated bookkeeping and accounting programs offered by educational institutions. Linnaus (1969) evaluated high school bookkeeping programs. King (1976) and Walcher (1970) evaluated two-year postsecondary school accounting programs. Stierwalt (1975) evaluated a four-year college accounting program. Tarry (1970) studied the five-year accounting program. Albin (1976) evaluated the impact of managerial accounting at both the secondary and collegiate levels.

Three studies were concerned with predicting job success in the bookkeeping and accounting field. Musselman (1976) focused on predicting job performance for entry-level bookkeepers. Luxner (1969) studied the factors affecting the employability of vocational bookkeeping students. Huus (1978) investigated the relative importance of selected course offerings in junior college terminal accounting programs upon job success.

Vittitoe (1973), Norton (1975), Funk (1975), and Thielbar (1977) studied the competencies needed by teachers of bookkeeping/accounting.

White (1978) studied the use of data processing by accountants.

Stumbaugh (1975) investigated the effect of college algebra and high school bookkeeping on achievement in the second course of college accounting. Gullo (1980) studied the relationship between remedial math and reading courses and accounting scores.

Schultz (1973) studied the problem of attrition of students in first-year college accounting. Ward (1975) identified successful practices for enrolling academically talented students in accounting and shorthand classes in high schools. Weekes (1978) investigated the interpersonal values held by accounting students as opposed to those held by nonaccounting students.

Summary

Most of the research in bookkeeping and accounting pertaining to teaching methodology has investigated the effect of teaching methods on achievement. Observations and recommendations of several researchers suggested that, while the use of such teaching methods as programmed instruction, individualized instruction, computer-assisted instruction, and audiovisual tutorial instruction did not significantly improve achievement, their use might be justified on the basis of improved efficiency in teaching/learning time or of increased enjoyment in the teaching/learning process. Further research is needed to determine whether or not such claims are defensible.

As computers continue to permeate the processing of financial information and as management information systems continue to receive greater emphasis, attention should be given to investigating the need for and means of incorporating these processes and systems into accounting instructional programs.

Research is also needed to clarify the role of accounting in secondary and postsecondary schools. The vocational objectives are challenged by the changing nature of jobs related to

financial information processing brought on by increased use of computers. The lack of agreement in research findings concerning high school accounting courses as background for college accounting, challenges the college-preparatory objective.

BASIC BUSINESS EDUCATION

A total of 223 research reports was reviewed in the area of basic business education. Five studies pertained to basic business as a field of study; the others were related to specific subject areas or courses. The research was distributed in the following manner:

Area of Study	Number	Percent
Basic Business	5	2.24
General Business	11	4.93
Business Law	7	3.14
Business Principles, Organization, and Management	2	.90
Introduction to Business	12	5.38
Personal Finance	4	1.79
Economics	81	36.32
Consumer Education	97	43.50
Consumer Economics and Economics	4	1.78
TOTAL	223	100.00

The research in basic business was directed toward or had implications at all education levels, kindergarten through doctoral programs at the collegiate levels. Some of the research focused on populations not related to educational levels. The distribution of the studies was as follows:

Area of Study	Elementary	Elementary/ Secondary	Secondary	Secondary/ Postsecondary	Postsecondary	Other Populations	TOTAL
Basic Business			3		2		5
General Business			11				11
Business Law	1		3		2	1	7
Business Principles, Organization and Management					2		2
Introduction to Business			1		11		12
Personal Finance			1		3		4
Economics	8	2	35	3	31	2	81
Consumer Education	2	1	49		20	25	97
Consumer Economics and Economics			2		1	1	4
TOTAL	11	3	105	3	72	29	223
Percentage	4.93	1.35	47.09	1.35	32.18	13.00	100.00

A variety of research methodologies was used. The following summarizes the types of research practices used:

Areas of Study	Experimental	Descriptive Test Data Analysis	Mailed Questionnaire	Materials Analysis	Materials Development	Personnel Interview or Observation	Q Sort	Historical	TOTAL
Basic Business		1	1	3					5
General Business	6	4			1				11
Business Law	2		2		1	1		1	7
Business Principles, Organizations, and Management	1	1							2
Introduction to Business	10		1					1	12
Personal Finance	3	1							4
Economics	23	27	18	8	3			2	81
Consumer Education	10	30	24	9	14	7	1	2	97
Consumer Economics and Economics		3				1			4
TOTAL	55	67	46	20	19	9	1	6	223
Percentage	24.66	30.04	20.63	8.97	8.52	4.04	.45	2.69	100.00

The following sections summarize the research in the areas of study.

Basic Business

Five studies dealt with problems related to basic business as a field of study rather than to specific courses within the area. Two investigators analyzed secondary high school basic business textbooks to identify specific types of content. Fox (1974) identified social responsibility content in high school basic business texts. L. E. Jones (1975) developed a matrix for classifying the content found in general business, economics, consumer economics, business principles, and business law textbooks at the secondary level. He identified topical content areas that are duplicated among the five basic business courses.

Sullivan (1973) and Boduch (1969) researched problems in basic business teacher preparation. Sullivan investigated the content courses, methods courses, areas of concentration, and evaluative methods needed by basic business teachers. Boduch developed videotaped presentations for use in the preparation of basic business teachers and analyzed the reactions of basic business methods students to these tapes.

Madison (1970) studied the relationship between general business knowledge possessed and the business courses completed by high school seniors.

General Business

Eleven studies investigated problems related to the general business course. The grade level of the general business courses studied varied from grades nine through twelve.

Scott (1973), Spellman (1980), and Bowman (1972) studied instructional materials used in general business. Spellman compiled a bibliography of source materials that can be used in teaching general business and determined the readability levels of these materials. Different rates of deletion were used with the Cloze procedure to evaluate the readability of the general business materials to determine which was the most appropriate. Bowman compiled a handbook of societal economic education materials that could be correlated with the units and topics in general business textbooks. He studied the effect of using the supplemental handbook explanation with the textbook information on the level of economic understanding of students. Scott developed multilevel instructional materials for a unit on business organizational structure. The materials were used to determine the effect on achievement when students were reading at their level.

Cooper (1969), R. E. Nelson (1970), Casey (1976), and Welling (1976) studied methodology for teaching the general business course. Nelson studied the effect of a multimedia approach on student achievement in general business. The study contains a number of recommendations concerning the use of multimedia materials based on student opinionnaires. Cooper studied the effect of teacher-prepared transparencies on achievement and retention in a unit on credit. Casey investigated the effect of learning activity packages upon achievement. Welling studied the effect of teaching methods upon the achievement of personal economic understanding in general business by comparing the traditional textbook method supplemented by the use of personal finance projects with the use of the traditional textbook method alone.

Hopkins (1968) and Lytle (1971) evaluated students' general business knowledge. Both compared basic business knowledges of students enrolled in general business classes with those who were not enrolled.

Brown (1971) and Seltzer (1970) were concerned with the general business teacher. Brown studied the relationship between supervisor and student evaluations of teaching effectiveness of general business teachers. Seltzer used a model of teaching behaviors based on observable verbal classroom activity. He studied the relationship between teacher conformity to the model and student achievement in the first course in basic business.

Business Law

Seven studies were completed dealing with business law. Three dealt with content, three with teaching methodology, and one with teacher effectiveness.

McCullough (1971), Morris (1976), and Tooley (1977) investigated issues regarding the subject matter which is or should be taught in business law classes. McCullough identified the precepts in the Code of Canon Law, which connoted American business law concepts. Morris identified legal concepts needed to prepare students to be legally competent consumers and citizens. Tooley identified legal issues that should be taught by using a list of forty-five issues proposed by members of the legal profession and having the issues ranked by business, home economics, and social studies educators and by curriculum leaders.

The studies concerning instructional strategies were compiled by Gaston (1969), Urbish (1971), and Howells (1976). Gaston developed a programmed study guide for teaching contract law and used a teacher-lawyer jury to evaluate the instructional materials. Urbish developed multimedia instructional materials consisting of dramatization, audio tapes, and slide presentations to teach due process of law. The multimedia materials were tested with groups of students having different characteristics to determine the effect of their use on student achievement. Howells compared achievement in the community college business law course using the programmed, small group, and lecture-discussion methods.

Wilkinson (1975) identified effective and ineffective secondary business law teacher behaviors as perceived by their students.

Business Principles, Organization, and Management

The two studies completed in the area of business principles both concerned the effects of treatments on student achievement. Shapiro (1973) studied the effect of the frequency of testing in business organization and management on two different groups of community college students having different academic levels. Ballard (1980) studied the effect of teacher leadership style on student achievement in introduction to management classes in a community college.

Introduction to Business

Twelve studies related to the introduction to business course were reviewed. Only one study applied to the secondary level. All the others involved postsecondary level courses.

Watson (1975) studied the effect of using a student-centered teaching plan as compared to a traditional teacher-centered plan on student achievement in an introduction to basic business course at the high school level.

Most of the studies at the collegiate level investigated the effect of teaching methodology on student achievement. These studies include Gentzell (1969), Mott (1971), Williams (1972), Phillips (1973), Sterrett (1977), Kapoor (1977), and Middleton (1980). The experimental treatments used were as follows: Gentzell—programmed materials; Mott—research activities; Williams—Socratic method of teaching; Phillips—Cloze procedure; Sterrett—audiovisual tutorial; Kapoor—decision-making/problem solving methods; and Middleton—computer-assisted instruction.

Heermann (1971) and Hegar (1977) varied the methodology used in teaching introduction to business. Heermann compared the effects of an audiovisual method with a conventional method to determine the effect of student awareness of business administration programs. Hegar studied the effect of "on-campus" class and "open circuit television instruction" on career interests, locus of control, attitude, and achievement of students in introduction to business.

Koorenny (1975) studied the status and role of introduction to business in the collegiate business curriculum. Moreau (1975) analyzed the development of American college introduction to business textbooks published between 1900 and 1973.

Personal Finance

Two of the four studies in personal finance dealt with the effect of teaching methodology upon achievement. Flodin (1969) compared the achievement of students taught by three different teaching-learning procedures: student-centered, instructor centered, and shared responsibility. McChesney (1980) studied the effect of frequent quizzes upon student achievement.

Bernardi (1969) compared the knowledge of personal finance possessed by students who completed the personal finance course with the knowledge of personal finance of students who had not completed such a course.

Stamps (1979) identified the common personal finance competencies needed by graduating high school students as perceived by teachers from business education, home economics, math, and social studies and by members of the business community.

Economics

A total of eighty research reports was reviewed in the area of economics. Three dealt with objectives and content, six with instructional materials, nineteen with methodology, five with curriculum, four with tests, and the remainder with evaluation of students, teachers, programs, and other factors.

Objectives and Content

Baer (1980) designed a questionnaire to measure the levels of economic theory and cognitive skill the instructors in community colleges expected their students to achieve. The questionnaire provides a comprehensive set of objectives for postsecondary economics courses.

Shaw (1969) and Manzer (1979) studied economic content. Shaw identified economic concepts believed by business leaders to be important to understanding the American business system. Manzer identified economic concepts deemed to be important for high school graduates as perceived by members of four consumer-related organizations.

Instructional Materials

Four studies focused on the economic content found in high school textbooks. Blackburn (1971) analyzed the economic content found in economic textbooks from 1920 to 1968. Rao (1971) studied the economic content found in social studies textbooks used in West Malaysia. Tarter (1969) analyzed the economic content found in United States history textbooks. Voege (1971) analyzed the content of economics textbooks published between 1936 and 1970 to determine the impact of Keynesian ideas on the economic concepts.

Two studies investigated the teaching materials entered in the Kazanjian Foundations Awards Program. These were completed by Nappi (1971) and Dale (1978).

Methodology

Nineteen studies dealt with methodology. Several investigators were interested in the effect of methodology on student achievement in economics.

R. E. Nelson (1970), J. A. Phillips (1971), and Wieder (1979) studied the effect that specifically stated behavioral objectives had upon achievement in college economics courses.

Porreca (1971) compared the effectiveness of an overhead projector presentation with a programmed textbook presentation in high school economics education.

Riegel (1969), Wentworth (1972), and Fraas (1978) studied the effect of simulation-gaming on the understanding of selected economic concepts. Fisher (1973) and Friesen (1975) compared the inquiry method of instruction with the conventional method of instruction to determine whether students achieved better when the inquiry method was used. Fisher worked with students in the upper elementary level, and Friesen worked with students in high school.

Millstein (1971) and Van Antwerp (1974) investigated the impact of computer-assisted instruction on achievement in economics at the collegiate level.

Investigators used a number of experimental treatments to vary from conventional methods in collegiate economics courses for purposes of determining their effects on student achievement: Barr (1978) used current events, practical economics problems, and simulation as a treatment; Miller (1978) used the self-paced method; Martin (1980) used the advance organizer approach. Fogel (1975) used videotaped materials for teaching economics to elementary school students.

Schultz (1972) used a series of economics readings with an eighth grade American history class for teaching economic concepts.

Darling (1973) studied the effect of feedback of quiz results on achievement in introductory college economics. The study involved both quiz frequency and feedback intervals.

Two studies used methodology as a variable to determine the effect of the treatment on factors other than achievement. Anderson (1973) used pre- and post-organizers to study their effect on students' retention of economic concepts at the collegiate level. Corbin (1971) examined the effects of a simulation game method on student political, social, and economic attitudes.

Curriculum

Five studies investigated the effectiveness of different curricular patterns for teaching economics. Bell (1972) studied the effects of teaching economics in middle school typewriting classes. Blanchard (1973) evaluated the effectiveness of teaching economic understanding in United States history courses. Enyinnaya (1973) studied the effectiveness of economics instruction when integrated as a component of a nongraded social studies curriculum. Muth (1978) examined the feasibility of offering community-based economic education as an alternative to the traditional high school economics education offerings. Prager (1974) identified courses and units of study used by Illinois high school teachers to implement essential economic principles in courses that contain consumer education content.

Tests

Four studies involved the development of tests of economics. Larkins (1968) developed a test for a first-grade economics course. Riddle (1975) designed and validated a test for measuring college student opinions on economic issues. Thexton (1976) developed and validated a test in economics for students in grades twelve and thirteen in Ontario. Hemmer (1969) developed an affective scale for use in economics classes.

Evaluation of Students

Fifteen studies were concerned with the evaluation of students in economics. These evaluative studies were of two types. The first type evaluated the effect of student characteristics on their achievement in economics. The second assessed economic understandings of specific groups of students.

Bellico (1970), Wall (1972), Bishop (1974), and Bone (1979) studied the relationship of selected student characteristics on student achievement in economics.

Studies evaluating the economic understanding of specific groups of students were completed by Key (1968), Alexander (1969), Gentry (1969), Rutledge (1970), Holland (1972), Boddy (1972), Diffine (1975), Weldon (1977), and Pasut (1978).

Studies evaluating economic understanding gained by students in free enterprise classes were completed by Clemmensen (1976) and Horn (1978).

Teacher Evaluation

Garman (1969) and Ganser (1969) evaluated the economic understanding of prospective teachers. Vines (1976) evaluated the understanding and attitudes of elementary teachers toward economic education. Bennion (1972) studied the relationship between teacher preparation and student comprehension of economics. Chilton (1979) investigated the change in teacher knowledge and attitudes related to economics after taking a course in economics. Cords (1973) studied student evaluation of economics teachers.

Program Evaluation

A number of studies evaluated different types of economics education programs. Brown (1968) evaluated the economics education in elementary schools in Louisiana. Parker (1969) evaluated economics education in Illinois schools grades kindergarten through twelve. Jones (1971), Nelson (1971), Moore (1968), Ellis (1969), Strom (1976), and Ulinfun (1978) evaluated high school economic education programs. Elmgren (1974), Chesney (1979), and H. R. Christensen (1979) evaluated economic education programs at the collegiate level.

Davidheiser (1975) and Casey (1971) completed historical studies of economics education. Davidheiser studied economic education in American high schools 1894-1924.

Evaluation of InService Programs for Teachers

O'Toole (1971), Karstensson (1974), Walstad (1978), and Oldfather (1980) studied teacher education programs.

Other Evaluative Studies

Hansen (1980) and Morrison (1973) completed prognostic studies. Hansen investigated early economic experiences of children that might be used to predict third grade children's economic knowledge. Morrison used the Delphi forecasting method to indicate the nature of economics education programs consistent with future education needs.

Eddin (1976) studied the effect of economic knowledge on attitude towards business. Proctor (1979) studied the effect of introductory economics on attitudes towards liberalism and conservatism.

Boardman (1969) analyzed the audience of an economics television course. Bryant (1978) compared the emphasis on economic concepts among three curricula.

Consumer Education

A total of ninety-seven research reports was reviewed in the area of consumer education. These included thirteen that dealt with content, seventeen with instruction materials and methods, nine with tests, five with issues, three with curriculum, and fifty with evaluation.

Content

Of the thirteen studies pertaining to content identification and selection in consumer education, six included lists of competencies. Swope (1976) listed consumer topics and had them rated by business education and home economics teachers. Mayer (1977) developed a consumer task list containing thirty-nine items in eighteen categories, which were rated as to importance by consumer education teachers. Nolte (1979) compiled a list of 200 consumer economics concepts stated as generalizations that were ranked by eight juries. Rowley (1974) developed a list of perceived and aspired consumer education competencies of consumer homemaking students that were ranked on the basis of importance by a consumer jury. Brown (1974) compiled a list of consumer tasks. Young adults rated the tasks they performed. Pinkham (1980) used a panel of consumer education experts to prepare a definition of consumer education and to develop a content-based model.

Seven studies identified content for specific areas of consumer education rather than for the content of the entire field. Sawaia (1978) investigated the consumer economics problems encountered by high school graduates who were unmarried four years after graduation. The problems were ranked by degree of difficulty. Forness (1976) studied the increased legal emphasis needed in collegiate consumer education. McKellips (1972) studied the personal income component in consumer education. B. J. White (1979) and Brink (1975) examined the problems encountered in home buying and identified content that would help prospective home buyers. Allen (1977) studied bankrupt households and identified concepts needed in adult education money management programs. Mason (1974) identified consumer awareness rights that should be disseminated through consumer education programs.

Instructional Materials and Methods

Only one study analyzed textbooks. Bannon (1975) reported on the sex stereotyping in high school consumer education textbooks.

Finders (1974) compared the use of Joint Council on Economic Education curriculum materials and methods with the use of commercially published economics textbooks and traditional methods.

Several studies involved the development and validation of instructional materials. Turner (1975) developed a simulated market to test young children for selected consumer skills. Gretchko (1968) developed programmed materials for teaching inner-city youth about consumer finance and credit. Levy (1976) prepared a videotape lesson on consumer education for high school students. Marts (1975) developed a personal finance simulation game. Rieger (1975) developed an audiovisual presentation on money and banking for a two-year college course. Lackey (1974) developed audiovisual presentations for teaching family food purchasing. Oldham (1976) developed and validated guidelines for preparing resources for low-reading-level consumers. Shamir (1979) developed a product-choice strategies measure to help children learn to use product information.

The effect of selected methodologies on achievement was the problem in six studies. C. R. Anderson (1969) used a simulation learning game for teaching consumer credit. Kincaid (1975) used learning activities packages for units on bargains, guarantees and warranties, stores, and services. Young (1976) worked with audiovisual and printed materials for teaching carpet purchasing. Watterson (1978) taught life insurance using individually paced materials. Lee (1976) used individualized materials for teaching investments. Brenneke (1978) utilized a computer managed instructional system (TIPS) to teach a collegiate-level consumer economics course.

Cunningham (1979) investigated the effect of two grading methods on student attitudes in a collegiate consumer issues class.

Curriculum

Three studies had curricular implications. Riney (1975) studied the effectiveness of the diffusion approach in the design of a consumer education curriculum. Feese (1976) investigated the effect on economic understanding of students in second-semester typewriting when timed writings presented consumer economics concepts. The effect of course organization on achievement was studied by Thomas (1969). Teaching consumer concepts as a separate course was compared with integration of these concepts into secondary school economics and advanced basic business classes.

Tests

Nine studies involved the development of consumer education tests. Lupher (1973), Adomatis (1974), Graf (1975), Stanley (1976), and Dalaba (1978) developed tests for evaluating consumer competencies at the secondary school level. McCall (1973) devised a test for assessing competencies at the elementary and high school levels. Adult consumer education tests were prepared by Tabel (1979) and Richardson (1976). Simmons (1976) developed a competency-based consumer credit counseling certification examination.

Issues

Five studies identified issues in consumer education. Burton (1970) compared the opinions of home economics, social studies, and business education teachers toward consumer issues. Rennebohm (1971) used home economics professors, business professors, and other professional persons who were members of the American Council on Consumer Interest in his comparison of opinions regarding consumer education issues. The opinions of secondary school teachers and the opinions of university teacher educators were compared in a study by Quinn (1976). Davis (1973) studied the attitudes of secondary school teachers toward consumer issues. Tafe (1976) compared the attitudes of consumer affairs specialists, consumer education teachers, and consumers toward the issues.

Evaluation of Consumer Groups

Numerous studies assessed the consumer understandings and/or attitudes of individuals who have a role in consumer education. Inacker (1971), Hilde (1973), and Maupin (1978) assessed the consumer economics understandings and attitudes of high school students.

A frequently researched problem has been the comparison of consumer economic understanding, attitudes, and competencies of students who have not taken courses where consumer economics was taught. Flis (1968), Larson (1969), Blair (1971), Meyer (1974), Hawkins (1975), and Duff (1976) investigated this relationship at the secondary school level. Grow (1977) and Curtis (1978) investigated it at the collegiate level. Bibb (1971) studied the relationship of prior educational experience in consumer economics at the high school level with achievement in a freshman consumer education class.

Bennington (1974) studied consumer education knowledge possessed by prospective teachers. Braun (1979) assessed the consumer economic knowledge possessed by older women.

Other evaluative studies investigated the relationship of consumer attitudes and understandings to certain selected factors. H. M. Miller (1975) compared the personal economic understandings and attitudes held by American Indian youth with those held by white youth in Wisconsin public schools. H. T. Johnson (1976) studied the differences in consumer knowledge between black and white public school students. Litro (1969) investigated the relationships between the social position of high school students and their consumer attitudes and understandings.

Chaffee (1974), Taylor (1968), and Buswell (1975) evaluated consumer behaviors of disadvantaged families, married university students, and college students, respectively.

Langrehr (1976) compared the consumer economic competencies of high school students to their attitudes toward business. Stinson (1975) studied the relationship of money management knowledge to socioeconomic factors of National Secretaries Association members. Coleman (1968) studied the influence of family finance education upon the personal and professional lives of educators. Anderson (1970) studied the influence of family finance education upon the personal and professional lives of counselors of low income persons. Crosby (1979) evaluated the cognitive effects of consumer information and education. Wellman (1975) compared the personal economic understanding of management and nonmanagement personnel in business and industrial firms.

English (1971), Dannison (1976), Flashman (1976), Griffin (1978), and Iams (1980) completed attitudinal studies. English studied the relationship of teacher and student attitudes toward consumer education in secondary schools. Dannison investigated the adult education programs. Flashman focused on the low-income consumers' attitudes toward credit and credit cards. Griffin examined the attitudes of Louisiana consumers and business persons regarding the State Office of Consumer Protection. Iams analyzed consumer attitudes toward federal consumer protective regulation and education efforts regarding selected consumer products which may be hazardous to the health and safety of consumers.

Evaluation of Teachers, Consumer Affairs Professionals, and Professional Education Programs

Siewert (1978) identified 128 competencies in eighteen clusters needed by consumer educators at the secondary school level. Green (1978) investigated the educational programs for preparing consumer education teachers and consumer affairs professionals. Fitzgerald (1979) identified educational experiences and professional competencies needed by consumer affairs specialists. Roberts (1978) surveyed doctoral graduates of consumer studies programs to identify the characteristics and educational backgrounds of consumer affairs career professionals.

A study by Dixon (1970) identifies the perceptions of interpersonal and consumer education concepts and priorities given to selected consumer education concepts for disadvantaged blacks by urban home economics teachers.

Program Evaluation

Eight studies evaluated consumer education programs. Programs in secondary schools were investigated by Welsh (1971), Franz (1972), Bitton (1973), Roberts (1974), and Seymour (1975). Brewer (1978) and Bowman (1968) studied collegiate programs in consumer education. Keckler (1972) identified the sources of education for consumers in Sioux Falls.

Other Studies

Two historical studies were reviewed. C. C. Thompson (1970) reported the influence of social conditions and curriculum trends on consumer education before World War II. Ginsberg (1974) traced the origin and development of consumer education in New York City public high schools.

Two studies analyzed religious works to identify consumer education concepts. Keck (1968) identified the areas of money management dealt with in the Holy Bible. Twitchell (1977) analyzed the published writings of Mary Baker Eddy to determine the metaphysical concepts that Christian Scientists might apply to select business and personal financial problems. Bennett (1978) studied the national priorities for federal funding of consumer education. Franks (1979) forecasted likely developments in postsecondary student consumerism.

Consumer Economics and Economics

Four studies researched problems relating to both economics and consumer education. Three of these were evaluative studies. Claar (1973) and Pooler (1975) assessed both the economic and the consumer education knowledges possessed by high school students. Kim

(1973) analyzed personal economic understanding developed in three types of courses: introduction to business, consumer problems, and social science (economic perspectives). Van Hook (1973) reported the contributions of Gladys Bahr to consumer and economic education at the secondary school level.

Summary

While much research has been conducted to evaluate different aspects of basic business education, to develop instructional materials and tests, and to improve teaching methodology, some of the problems that affect all research in the field are not being investigated.

Much duplication of content exists among the courses in basic business education. Attention needs to be given to identifying the subject matter in the various areas of basic business: consumer education, economic education, free enterprise education, legal education, and entrepreneurial education. Research is also needed to examine the structure of the content that might shed light on effective and efficient ways to organize and sequence the content for improving instruction. Very little has been done to examine the relationships of one area of basic business to another or to clearly define each of the areas.

COMMUNICATIONS

A total of seventy-three doctoral dissertations or independent research reports has been identified as examining instruction-related communications topics. Most of these studies (thirty, or 41.1 percent) have dealt with the identification of appropriate content for the business communications course. The next largest group of studies (twenty-two, or 30.1 percent) has evaluated different teaching methods in business communications classes.

When instructional content or teaching methods have been directed toward a particular group of students, postsecondary or collegiate populations have been by far the dominant focus. A total of fifty studies (68.5 percent) have included programs or students at postsecondary technical institutes, community/junior colleges, four-year colleges/universities, or industry training sites. Two studies included both postsecondary and secondary students, but only one study focused on high school students. The remaining studies (nineteen, or 26.8 percent) dealt with research questions not specific to any educational level.

Experimental designs or mailed questionnaires were the most common types of research. The following summarizes the types of research practices used:

Research Methodology	Number	Percentage
Experimental	26	35.6
Mailed Questionnaire	23	31.5
Materials Analysis	9	12.3
Personal Interviews/ Observations/Critical Incident	9	12.3
Descriptive Test Data Analysis	3	4.1
Q-Sort	3	4.1
TOTAL	73	100.00

Six research studies provide historical reviews of written business communication and teaching in this area. Chute (1978) and J. F. White (1974) trace the evolution of business letter writing through reviews of actual business correspondence. Milligram (1973) and Sobolik (1970) have reviewed letter-writing theory through analyses of business communications textbooks from 1915 through 1972. Comprehensive reviews and syntheses have been completed of research related to the content and teaching methods in business communications (Wise 1970) and reading and study skills in business education (Walters 1973).

Summary is provided below of business communications studies in the following areas: course content, program evaluation in relation to businesses' communications requirements, program descriptions, teaching methodology, and student evaluation.

Content of Business Communications Courses

The most frequent research question in the business communication field has been that of determining the content to be included in the course, particularly at the postsecondary or collegiate level.

Both Adames-Hill (1978) and Hansen (1971) have used the Q-Sort instrument to obtain a ranking of potential course objectives from business representatives, business communications teachers, and, in the Adames-Hill study, business communications graduates. Both studies obtained considerable agreement among the participating groups, and both studies found disagreements on objectives related to speaking and listening competencies.

Gump (1979) and Hart (1973) both sought perceptions about the place of the business communications course in the business administration curriculum. The opinions of educators in business administration areas other than communications were compared with business communications teachers as well as, in the Gump study, with business executives. The two groups of educators differed in their ranking of business communications concepts. As was revealed in the Adames-Hill and Hansen studies, business executives considered oral communications more important than did communications teachers.

Clark (1968) focused entirely on the area of oral communication effectiveness in business in order to determine how business communications courses could develop these competencies. Because of the broad range of applications for basic oral communications skills, Clark concluded that students needed correspondingly broad background in the behavioral sciences. The business communications course could build on this broader background by taking a problem-clinic approach to specific speaking, listening, writing, and reading skills within the business context.

Two studies that examined content issues in a narrower sense are those by Crisp (1971), which determined current attitudes toward selected English usage expressions, and by Parker (1972), which established general guidelines for written applications based on opinions from industry recruitment representatives.

Several studies have identified communications competencies for specific occupational groups. Scott (1974) developed procedures for establishing lists of communications skills for selected occupations based on the judgments of employed workers, management representatives, and teachers in the occupational area. The written communications competencies required by secretaries, clerical workers, and paralegal workers have been identified by Eastlack (1975), Heinemann (1978), Salzman (1979), Treece (1971), and West (1976). The reading requirements of office jobs have been examined by Heinemann (1978), Ross (1977), and Salzman (1979). Both Eastlack (1975) and Ross (1977) compared the communications tasks of employed office workers with classroom instructional materials.

The writing problems encountered by managers and other writers in business offices have been described by Eaton (1972) through the use of personal interviews and observations and by Woodcock (1977) through the use of the Q-Sort technique. Woodcock found that managerial trainees, their supervisors, and their secretaries perceived the oral and written communications problems of the managerial trainees differently. Eaton developed guidelines to be used by businesses and schools for the improvement of writing skills.

The specific occupational group of accountants has been the focus of communications research in two studies. The writing skills required by accountants have been examined by Addams (1978), and Golen (1978) determined the barriers to effective oral/interpersonal communications which accountants perceived to be most serious.

Actual business correspondence has been analyzed by Cole (1969), Otwell (1970), and Payne (1975) to determine the types of letters written by business managers, their reading level according to the Gunning Fog Index, and the quality of the writing according to established guidelines. Changes in letter-writing procedures that have accompanied introduction of word processing centers were examined by Lewis (1977).

Experimental research procedures have been used in three studies to determine the effects of different organizational patterns within special request letters (Krajewski 1979), and short (Landrum 1974) or long (Pearce 1974) business memorandum reports. The use of inductive or deductive organizational plans had no significant effect on comprehension of special request letters or short business reports. Headings, however, improved comprehension on short reports. The interactions of several organizational variables and the use of headings were more complex in long reports.

The content of the report writing course has been addressed by two studies using surveys of business executives (W. P. Thompson 1970) and analysis of business reports together with interviews of report writers (Van Fleet 1969). Criteria important for report writing and guidelines for a report writing course have been developed.

Nonverbal communication has been explored in two studies. Young (1974) examined the effect of unwritten messages (metacommunication) within business letters. Those elements in letters from which persons induce added meanings were identified as well as the awareness of different groups of business people to these elements. Zimpfer (1974) compared the perceptions of executives and their private secretaries toward nonverbal symbols in business offices. Areas of agreement and disagreement were identified.

The area of business communications training films for industry users was reviewed by Miller (1970). The high cost of these media may account for continued use of many old films prepared largely as persuasive tools for low-and middle-management levels.

Program Descriptions and Evaluations

The studies reviewed above have focused on establishing business communications course content based on perceptions of managers and office employees. Other studies have sought to determine the current status of business communications offerings in postsecondary institutions (Bullard 1971; Hayes 1974; Keyser 1971; and Terrell 1979). Nationwide surveys by Bullard and Hayes have shown considerable diversity in course content, materials used, grading practices, and teacher background. While the course is judged to be more than business letters and report writing, letter writing has consumed the major portion of class time. The need has been identified of either requiring basic writing skills as a course prequisite, or spending more time on this area because of student need.

The extent of teaching oral communications skills in public high schools was reviewed by Engerrand (1970). While approximately 43 percent of the schools offered a business communications course, the teaching of oral communications was judged to depend largely upon teacher initiative because of a lack of appropriate instructional materials.

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Four studies have evaluated business communications programs on either a local or regional scale by matching the business communications needs of business managers and secretaries with the perceptions of business communications teachers (Hergenroeder 1973; Jennings 1974; McCallum 1980; and Tilley 1977). Differences of opinions about communications topics have resulted in the development of guidelines for the communications course. A problem in interpreting comparisons of industry needs and course organization relates to judgments about degree of "emphasis" given to selected topics. That business managers spend "extensive" amounts of time in an activity or consider a topic "very important" does not easily translate into the amount of instructional time to devote to this topic. The importance of a job activity or the amount of time required on the job is not directly related to the amount of instructional time required to develop that competency.

Recognizing the difficulty of using industry reports of job activities for curriculum changes, the research is consistent in identifying a need for more oral communication instruction than has typically been made available in business communications courses. McCallum (1980) examined oral communications specifically in the Dallas, Texas area and reported unmet needs for listening and public speaking skills.

Furr (1968) evaluated the effect of a business speaking course on the self-concept and self-confidence of business students. It was concluded that a business speaking course was more conducive to the development of a positive shift in self-concept among students than courses in psychology or physical education.

A final study related to program evaluation sought to measure the degree of improvement in paragraph writing which resulted in a business communications class (W. Brown 1970). While some improvement in writing was evident, the researcher failed to recognize the effects of regression toward the mean for the high and low scorers on the pretest.

Teaching Methods

Approximately one-third of the research in business communications has been directed toward evaluating different teaching methods.

Since improved writing is a primary goal of instruction, a key question for communications teachers has been how much writing practice is necessary. Four studies have shown that a larger number of writing assignments does not result in better writing performance (Baker 1974; Dibattista 1979; Hart 1978; and Inman 1970).

When comparing the use of twenty-five, fifteen, ten, or six writing assignments during one semester of instruction, Inman (1970) found that those writing only six assignments performed significantly better on a "Principles of Business Writing Test." Baker (1974) showed that evaluating letters was as effective as writing letters in developing writing skills, although students questioned the grading fairness of not writing any letters. Dibattista (1979) found that three treatments of using cases, additional writing, or a listening program were equally effective for developing comprehension of writing principles. Hart (1978) obtained higher achievement results for students who received formal instruction in theories of communication and had less writing practice than a control group.

The use of individualized or personally prescribed instruction in business communications has been shown to be equally effective as group instruction for developing letter writing skills

(Hartman 1973; and Young 1979) and report writing skills (Bradshaw 1974; and J. K. Christensen 1979). Bradshaw's study illustrated the significant effect on student achievement of individual teachers, an effect that other researchers have also observed. This study also supported the conclusion of others that objective examinations and letter-writing examinations are not highly correlated. Baker (1974) has also demonstrated that a single writing sample is not a reliable measure of students' abilities.

The use of transparencies to teach letter-writing has been shown by Mooney (1972) to be more effective than using the chalkboard for the same purpose.

Five studies have evaluated different ways to provide review or remedial instruction in English grammar and style knowledges. Computer-assisted instruction (Bell 1978) has been a faster and equally effective method as programmed instructions in improving knowledge of comma rules. Programmed instruction on English usage (Schlattman 1976) has been more effective than lecture or discussions alone. Intensive review and reinforcement of writing and grammar principles (Manship 1974; and Pickard 1971) or an "overt-evaluation-learning" approach (Drew 1975) have produced equal or better usage skills than no attention to English mechanics.

Using different sets of self-instructional materials for building business vocabulary has produced inconsistent results (Barnett 1972; and Vance 1977). Providing videotaped review for use of the dictionary has also led to nonsignificant achievement differences (Dunlap 1979). Videotaped feedback during the development of letter dictation skills also did not improve dictation performance (Austin 1979). Melrose (1974) has shown, however, that the dictation of letters is as effective as handwritten letters for developing letter-creation performance.

Both Crump (1977) and Terry (1976) have evaluated the development of listening or interpersonal relations skills. Terry found that gains in listening skills as a result of a ten-week listening program were temporary. While retention effects were not examined, Crump (1977) found that the use of encounter tapes to teach small group communication skills resulted in improvement of business students' interpersonal communication discrimination abilities.

The critical incident collection method was used by Maynard (1974) to identify effective teaching methods in the broadest sense for business communications teacher preparation. Critical teaching requirements were identified in the areas of instruction, instructor characteristics, evaluation and feedback, and discipline.

Student Evaluation

Three studies have examined issues related specifically to student evaluation practices in business communications. Weavil (1979) compared the use of checkmarks on students' papers in contrast to letter grades and found no differences in student achievement or attitudes.

Guidelines for evaluating letters were developed by Sapp (1980) and Simpson (1976). Sapp established guidelines for collection letters using letters from three companies as models. Simpson used the judgments of business writers and business teachers to identify technical elements that cause letters to be "mailable," "mailable after correction," or "not mailable."

Summary

While there has been a balance between business communications research examining both teaching content and methodology, the neglect of the secondary level is conspicuous. Only three studies have been directed toward improving communications instruction at the high school level.

Since communications skills invariably appear at the top of the list of critical job qualifications for all fields and levels of business employment, research directed toward improving teaching in business communications should be carried out at all levels of business education. The effectiveness of integrating oral and written communication skills into several secondary business courses should be evaluated.

BUSINESS MATHEMATICS

A number of studies during the past decade have examined course content, its correlation with student career objectives, various instructional strategies, and the evaluation of business mathematics courses at various educational levels. Of the thirty studies reviewed here, twelve studies (40 percent) were directed to junior and community college programs; seven studies (23.33 percent) to the high school level; five studies (16.67 percent), to college level; one study (3.33 percent) high school; two studies (6.67 percent) middle school; and three studies (10 percent) to a combination of educational levels. In those research efforts, five different methodologies were used: experimental (eighteen studies, or 60 percent); questionnaire (five studies, 16.67 percent); descriptive test data analysis (five studies, 16.67 percent); personal interview and observation (one study, 3.33 percent); and materials analysis (one study, 3.33 percent).

Objectives and Content

Cartens (1971) and Hall (1972) completed similar studies to investigate the achievement of community college students in business mathematics in relation to their business career objectives. Both studies used the same instruments to collect data: the Business Mathematics Achievement Test, the Business Career Objectives Scale, and the Instructors Business Mathematics Inventory. Cartens (1971) concluded that there was a significant correlation, but not a high one, between business mathematics achievement and strength of the career objective while Hall (1972) concluded that there was not a significant relationship between these two factors. Both researchers arrived at these conclusions: (1) there were significant differences in achievement among the various business majors, and (2) there were significant differences in achievement among students taught by instructors with varying teaching assignments, class loads, preferences, experience, and attitudes toward the business mathematics courses.

Several studies investigated the competencies needed by students with different career objectives. Johnson (1973), McAnelly (1978), Scrittorale (1972), and Salzman (1979) used different sets of business math competency lists to study the needs. From findings secured by questionnaires sent to graduates, employers, and faculty, Johnson (1973) concluded that the 120 competencies currently taught in two-year colleges in New York State were adequate for preparing students for beginning employment in the fields of accounting, business administration, and secretarial science. Based on the opinions of supervisors in large retail firms in the Chicago area, McAnelly (1978) concluded that the perceived importance of the seventy-six mathematical competencies identified in the study varied among the types of entry-level jobs available to beginning retail workers. The proficient use of electronic calculators was identified as the most important competency for all employees, and statistics and graphs were the least important.

Scrittorale (1972) and Salzman (1979) were both concerned with the math competencies needed by beginning workers in relation to those needed by experienced workers. Scrittorale (1972) concluded that there was a common core consisting of twenty of the twenty-five mathematics applications identified in the study that was needed by all business majors in order to secure a job, perform on the job, and advance to a higher level. Salzman (1979) found significant differences in the types of mathematical concepts encountered by beginning secretaries when compared to those encountered by experienced secretaries.

Instructional Strategies

Several studies were concerned with instructional strategies in business mathematics classes. Eight studies investigated the use of calculators as tools for teaching business math: Carver (1970), Shuch (1975), Fischman (1976), Aldridge (1976), Smith (1977), Boling (1977), Lunder (1978), and Edsall (1979). Carver (1970) and Smith (1977) studied the use of calculators in collegiate business math classes. Both found no significant difference in mathematics achievement when calculators were used. Smith (1977) further concluded that there was little difference in attitude toward business mathematics between students using calculators and those not using calculators.

Shuch (1975) found that the use of calculators did not improve community college students' ability to perform fundamental arithmetic processes, their arithmetic problem-solving ability, or their critical thinking ability. The studies investigating the use of calculators in high school business mathematics classes reveal similar findings. Fischman (1976) and Boling (1977) both found that the use of calculators in high school math classes did not result in significant gains in either mathematical problem-solving ability or in student attitude toward mathematics. Fischman (1976), however, found that, even though students' mathematical problem-solving ability was not improved, the students could solve problems faster and with fewer arithmetic errors using machines than they could with paper and pencil. Boling (1977) observed that, even though students did not like math any better when machines are used, they did prefer to use machines rather than to solve problems using pencil and paper.

Lunder (1978), in investigating the effect of calculators on test anxiety in high school business math classes, found that the use of calculators does not reduce test anxiety but that it does improve students' overall mathematical achievement.

Aldridge (1976) studied the effect of calculators on the achievement of middle school remedial mathematics students. She concluded that the posttest scores in basic arithmetic skills for students who did not use calculators were significantly higher than for those who did. Thus, her findings support the previous finding: calculators do not improve mathematics achievement.

Edsall (1979) investigated the need for mathematical skills and for calculator operations skills in business occupations. She concluded that businesses expect employees in office occupations to have skill in operating calculators and that at least fourteen mathematical concepts are used by office workers in all businesses.

The research concerned with the use of calculators in teaching business math indicates that calculators cannot be justified as instructional tools for improving achievement in mathematical reasoning or problem solving, or for changing attitudes about business mathematics. The use of calculators in business math at all levels—high school, junior college, and college levels—can be better justified on the grounds (1) that students prefer to use machines rather than pencil and paper and (2) that employers prefer to hire people who know how to operate calculators. Learning to use calculators in business math classes is a by-product that may aid the student in working problems more rapidly and accurately and in acquiring a job.

Four studies were concerned with the effectiveness of using computer-assisted instruction (CAI) for teaching business math. McCool (1973), Goodson (1975), Hughes (1976), and Durgin (1977) investigated different kinds of CAI as instructional tools for improving students' understanding of mathematical concepts and for improving students' attitudes about business mathematics. All four researchers found that neither student achievement in mathematical reasoning and problem-solving ability nor student attitudes toward business mathematics are

significantly improved by using CAI. Some of the researchers pointed out that CAI may still be recommended for use in business math because (1) the students tend to do as well as, even though not significantly better, than students taught using traditional methods, (2) as a by-product the students acquire a knowledge of computer technology that is generally accepted as being desirable for business employment, and (3) students generally report that they like CAI better than a pencil-and-paper, lecture method of instruction in business math.

Two studies investigated individualized instruction as a means of improving student achievement and attitude in business mathematics. Harshbarger (1970) developed an individualized mathematics curriculum for the experimental group. His findings revealed that the students enrolled in the individualized mathematics program had no better perception of their mathematical ability relative to their degree program than did the students in the control groups. He did find that the students in the experimental groups had a more favorable attitude toward the business math curriculum in terms of interest, amount learned, and method of teaching than did the students in the control groups. Liquori (1973) studied the applicability of the Personalized System of Instruction (PSI) for teaching mathematics to college students. Students taught using PSI performed not as well on the posttest in business mathematics as those taught by traditional methods.

Other studies investigating instructional strategies were conducted by Swanson (1972) and Schmeling (1975). Both researchers studied the effects on math achievement and attitude when math principles are integrated with principles from other subject areas. Swanson (1972) integrated mathematics principles with insurance principles. The experimental treatment involved the use of (1) a unit outline on insurance principles, (2) a set of 142 slides illustrating insurance principles, and (3) worksheets for arithmetic computations applicable to insurance principles. The control group did not include the set of slides for illustrating insurance principles. The experimental group did not perform significantly better on the posttest than did the control group; however, there were positive changes in student attitude and enthusiasm, class discussion, and teacher attitude when the slides were used.

Schmeling (1975) integrated economic and mathematical concepts to study the effect upon student achievement in and student attitude toward the two disciplines. He also studied the effects on achievement and attitude that two experimental treatments involving methodology would have. One experimental group was taught using lecture and field trip methods. Another was taught using lecture and games and simulations methods. None of the experimental treatments produced significant improvements in achievement or attitude. Schmeling concluded that a desired increase in knowledge of one discipline by integrating it into the knowledge of another discipline is a pedagogical implication that cannot be easily achieved.

Williams (1975) investigated the use of mastery learning in business math at the community college level. Students in the experimental group were required to perform at a specified mastery level on each unit test before progressing to the next unit. Students in the control group progressed in lock-step fashion through all of the units. It was concluded that mastery learning is effective when the subject matter is moderately difficult. There was no significant improvement in achievement when mastery learning was used with the least difficult units and most difficult units.

The Smith (1978) study sought to determine whether students performing problem-solving arithmetic with simple figures (round numbers) would score higher on a problem-solving achievement test than similar students performing similar activities with complex figures. It was concluded that problem-solving achievement is influenced by the mathematical ability of a

student and that minimizing the need for computational activities by using simple figures in problem solving tends to help medium and high ability students to perform better the processing aspects of problem solving.

Evaluative Studies

Donnellon (1978) examined the procedures which may be used by local education agencies to establish minimal computation competency in consumer mathematics. She established procedures and criteria for validating skills at three levels: highly effective level of competence, minimal level of competence, and not needed level. Twenty-seven skills were identified by examining existing competency-based education programs. All twenty-seven were found to constitute minimal level competencies using the criteria and procedures developed in the study.

Barger (1975) studied guidelines used in advising students who planned to enroll in business math courses at vocational-technical schools. She concluded that the best predictors of success in business math were reading ability and mathematical ability, and that both of these were best measured by the numerical score on the GATB (General Aptitude Test Battery).

Davis (1974) evaluated the effectiveness of a teacher education training module for business mathematics. She concluded that the training module increased the ability of the teachers to teach the subject matter, but that the teachers' attitudes about the subject matter were not significantly influenced.

Hantjis (1969) and Underwood (1976) studied problem-solving abilities in relation to student characteristics. Hantjis (1969) analyzed five types of errors made by students in high school business arithmetic (four basic processing errors, knowledge errors, direction errors, transfer errors, and decimal knowledge errors) in relation to five student characteristics (grade, sex, IQ, reading level, and previous math and business course work). He concluded that intelligence and intelligence-related factors were the only factors analyzed that appeared to be related to the types of errors committed or the degree of accuracy of the subjects.

Underwood (1976) studied the efficiency of community college students in solving consumer mathematics problems selected from the National Assessment of Educational Progress. Students were divided into Hi-math and Lo-math groups using the math scores from the Cooperative School and College SCAT Test. The students were also divided into the Hi-comp and Lo-comp groups based on their comprehensive scores on the Nelson-Denny Reading Test. The most efficient problem solvers were the Hi-math, Hi-comp students. The least efficient were the Lo-math, Lo-comp students. Students in the Lo-math, Lo-comp group made more errors per problem than students in other groups. Fewer errors per problem were made by Hi-math, Lo-comp students.

Eirich (1968) compared the business math achievement of business mathematics students, algebra students, and general math students. Using the scores on the Business Mathematics Achievement Test for the three groups, the finding led the researcher to conclude that the business mathematics course was more effective than the algebra or general math in terms of the amount of business math learned. General mathematics and algebra had little effect on business math achievement.

Summary

In similar studies on the correlation between the strength of students' career objectives and their achievement in business mathematics, Cartens (1971) and Hall (1972) reached differing conclusions but noted the effect of instructor characteristics, teaching assignments, and class loads.

A number of studies sought to determine the competencies needed by students with differing career objectives. Scrittorale (1972) identified a core of twenty competencies needed by all business majors, while Chicago area retail supervisors surveyed by McAnelly (1978) stressed proficiency in the use of electronic calculators. Those supervisors varied in their perceptions, however, of other mathematical competencies needed by entry level retail workers. In New York, Johnson (1973) saw the competencies taught in two-year colleges there as adequate for entry-level jobs in accounting, business administration, and secretarial science. Salzman's (1979) study, however, of beginning and experienced secretaries indicated that mathematical concepts encountered on the job in that occupation could change significantly over the course of employment.

In studies of instructional strategies, the use of electronic calculators in business mathematics courses was seen as justified on the grounds of student preference and employer's desire to hire employees with that competency. While the utilization of computer-assisted instruction may also be desirable for similar reasons, those methods did not promote major changes in students' mathematical achievement or attitude toward business mathematics. Harshbarger (1970) and Liquori (1973) also differed in their assessment of the effectiveness of indivudalized instruction at the college level.

Studies on the effectiveness of integrating mathematical principles with content from another subject area (Swanson 1972 and Schmeling 1975) indicated no significant change in achievement. Mastery learning, however, was shown to be useful at the community college level when applied to subject matter of moderate difficulty.

Among the evaluative studies, Eirich (1968) concluded that business mathematics courses were more effective than algebra or general math in terms of amount of business math learned. Barger (1975) found reading and mathematical ability, as measured by the GATB, to be the best predictors of success in business mathematics. Underwood (1976) studied the efficiency of consumer math problem solving at the community college level, based on indicators of students' reading and mathematical abilities. And Hantjis (1969) concluded from his analysis of arithmetic errors and student characteristics that only intelligence-related factors seemed to correlate with the number or types of errors committed in a high school course.

BUSINESS DATA PROCESSING

A total of ninety-two doctoral dissertations or independent studies has been completed in areas related to business data processing education. A larger group of studies in this area completed between 1971 and 1976 have been included in a comprehensive review and synthesis of research in business data processing education by Schrage (1978). Master's level research and other periodical literature have been included in the Schrage review.

The most common research question in the ninety-two studies included in this summary has been identification of the appropriate data processing content to include in secondary, postsecondary, and teacher education programs. Industry data processing users have been the source of job competency or task performance information in eighteen studies (19.6 percent); twenty-six additional studies (28.3 percent) have used combinations of industry, teacher, and student evaluations to make judgments about appropriate program content. A third kind of study (eighteen studies, or 19.6 percent of the total) has examined the characteristics of data processing programs, students, and teachers as a basis for determining instructional needs.

Less than 20 percent of the studies reviewed included examination of data processing teaching methods (seventeen, or 18.5 percent). Nine studies (9.8 percent) sought predictive measures of data processing course or employment success, and three studies examined the content, organization, and difficulty of data processing instructional materials.

The use of mailed questionnaires or personal interviews has been the most common research design applied. A total of fifteen studies has used experimental designs to evaluate instructional methods. The several research methodologies used are summarized as follows:

Research Methodology	Number	Percentage
Mailed Questionnaires	39	42.4
Personal Interviews/Observations	16	17.4
Experimental	15	16.3
Descriptive Test Data Analysis	13	14.1
Materials Analysis	7	7.6
Materials Development	2	2.2
TOTAL	92	100.0

Over half of the studies included the use of student or teacher groups at the postsecondary technical school, community/junior college, or four-year university level (fifty-two studies, or 56.5 percent). Nine studies (9.8 percent) included students or teachers at both the secondary and postsecondary levels. Fifteen studies (16.3 percent) included only high school students/staff. The remaining sixteen studies (17.4 percent) did not include the direct involvement of either student or faculty groups.

The following sections will summarize the research in the main areas of content identification, teaching methods, prognosis of data processing achievement, and materials analysis.

Data Processing Content

Studies seeking to establish or confirm the appropriate content for data processing programs are summarized by the research approach used. The first group sought information primarily from industry users or employed data processing personnel. The second group compared the competencies used by employed data processing staff with existing data processing programs. The third group examined current data processing programs, teachers, or students without direct comparison with external criteria for decision making about data processing content.

Content Determination Based on Industry Surveys

Members of the Data Processing Management Association (Harbert 1980; and Zapach 1972) or business organizations within a regional area (Bierly 1979; Borcher and Joyner 1973a; Bucks 1972; Cannon et al., 1978; and Schillak 1975) have been the source of lists of job tasks or competencies which are part of data processing job categories. Job descriptions and educational requirements have been outlined in these several studies for the areas of data processing management, systems analysts, programmers, computer operators, and data entry operators. COBOL has been confirmed in several studies as the most commonly used programming language for business applications.

Curless (1973) compared changes in data processing job requirements from 1969 to 1973. His findings for the two time periods reinforce those of later studies that have shown higher level educational requirements in the broad field of business and business data processing for the systems analysis and managerial areas of data processing. Technical or two-year community college preparation is the minimum required for programmer or computer operations positions. Hurst's (1971) investigation of data processing jobs of a clerical nature has shown these positions to be attainable with high school or two-year college training.

Both Christensen (1969) and Rall (1974) have developed lists of data processing competencies appropriate for all students at the high school level. The secondary level data processing program has been judged to have a greater general education responsibility than vocational education. Data processing career exploration begun in the high school would need to be continued at the postsecondary level for most entry-level data processing jobs except those in the data entry or clerical area. With regard to these job areas, M. F. Johnson (1976) has provided extensive descriptions of the educational qualifications, operational task distinctions, and career ladders in the computer production operations job cluster of the data processing industry. This cluster includes positions in the following areas: data processing control jobs, data entry jobs, and computer and peripheral equipment operator jobs.

Organization of the programming function within business firms has been examined by Frazier (1970). Because of the diversity of approaches for organizing the programming function in the twenty firms analyzed and the continual changes and evolution of this area, general guidelines were not suggested for educational programs. Two commonalities in most of the firms were administration of the Programmer Aptitude Test and the availability of classroom and programmed instruction for programmers. The content required for programmers was also investigated by Dunlap (1975) in a study not involving industry personnel, but rather the development of a test that would describe the cognitive skills comprising FORTRAN programming.

The higher level data processing occupations of systems analysts and top management have been described by Shrout (1970) and Munyan (1977). Schillak (1975) examined personnel requirements of the financial accounting system in companies using computers. Pearce (1973) compared the congruency between data processing staff and data processing users with regard to the meaning of twenty data processing terms. Differences on a semantic differential instrument between persons with different job titles indicated a need for better communication and user education.

The teaching content implications associated with data processing service centers were examined by Gunderson (1972). A comprehensive review of data processing service centers nationwide was provided as well as current problems and trends in this segment of the industry.

Content Determination Based on Program Evaluation

Once data processing instructional programs have been developed, their ability to prepare students for specific jobs or to permit students to attain identified competencies has been judged by comparing anticipated program outcomes with industry requirements or actual student achievement. When industry requirements have been part of program evaluation, the studies differ from the ones just described in two respects: either existing school curricula or teacher perceptions have been collected in addition to industry perceptions of need, or student perceptions of program success have been collected in addition to industry perceptions of need.

Franklin (1978) and Willhardt (1971) compared both secondary and postsecondary school data processing programs and industry requirements for entry-level employment. Postsecondary programs, including junior/community college, technical school, and four-year university level, have been compared with perceptions of data processing industry representatives in studies by Gorgone (1974); Joslin (1972); Keul (1978); Lyon (1973); Overton (1973); Pollack (1973); and Walden (1968). Local job descriptions or competency listings have been presented along with curricula designed to prepare students for these job areas. When differences have been noted between school programs and industry requirements, program changes have been recommended. It is questionable, however, whether industry statements about the importance or difficulty of competencies is sufficient information for recommended time allocations in instructional programs.

Both Pollack (1973) and Gorgone (1974) have noted that while industry users have stated a preference for COBOL as the business programming language, followed by RPG as a second choice, colleges and universities have taught FORTRAN as the language of first or second preference. Wide industry use of the Programmer Aptitude Test was again documented, as well as industry's need for personnel with good communication and problem-solving skills.

The data processing knowledges required by administrative office managers and accountants have been examined by Talbot (1976) and Kensky (1970). Both studies compared the perceptions of university faculty with either employed office managers or public accountants.

Five studies have included the perceptions of former students along with those of data processing instructors and data processing employers. Godderz (1978) compared data processing graduates' judgments about the importance of data processing instructional topics with the judgments of members of the Data Processing Management Association; significant

differences existed between these groups as well as between persons in companies of different sizes. Hruby (1980) also reported differences as well as areas of agreement between students' perceptions of the importance of course objectives and the perceptions of advisory committee members, employers, and instructors. Program changes were recommended as a result of the differences.

The same survey instrument was used as part of program evaluations reported by Kettner (1976), Stoehr (1976), and Tesch (1977). Data processing g[illegible]s, their instructors, and their employers reacted to the frequency of performance, importance, a[illegible] future need for seventy-five competencies. Generally high agreement was found among the three groups in all three studies, competencies were ranked according to their ratings, and recommendations were made for program changes in the respective technical institutes.

Comparisons have been made between the effectiveness of data processing programs in proprietary and public postsecondary schools in studies by Miller (1973) and Toyne (1974). While Toyne found no differences in the preparation of programmers by the two types of institutions, Miller found that program completers from public postsecondary schools had more work experience than completers from the proprietary schools. This work experience, as well as enrollment in a high school college preparatory program, contributed significantly to programmers' effectiveness.

Specific instructional programs have been evaluated on the basis of student achievement alone. Wall (1968) followed up the teachers who participated in three summer institutes designed to prepare data processing teachers. The most valuable portion of these institutes was actual equipment operation, a common finding in students' evaluation of data processing instruction. Stevens (1980) established the need to continue a self-paced, variable-entry course in data processing by following up course participants. The ability of programming instruction to improve students' deductive skills was examined experimentally by J. K. Taylor (1970). Nine weeks of programming instruction were not sufficient to affect student performance on a conditional reasoning test in contrast to a course in typewriting.

Two studies have developed testing instruments for evaluating student attainment of key concepts in data processing. Student achievement in a college-level introductory data processing course may be evaluated by either of two parallel test forms developed from interviews with data processing managers, employees, and teachers (Korn 1968); or achievement may be evaluated at the high school level (Amundson 1975) by one instrument measuring the data processing concepts identified as essential by Christensen (1969).

Engel (1974) reviewed the materials developed as a result of the Association for Computing Machinery's 1968 curriculum on computer science education. Needs were identified for instructional materials with more business applications and for training secondary and postsecondary data processing teachers.

Rosich (1980) included instructional materials evaluation in comparing the data security topics included in collegiate introductory data processing courses with the recommendations of data processing managers. Areas of both agreement and disagreement on data security topic importance were identified.

Evaluation of the COBOL programming language was undertaken by Litecky (1974) based on analysis of students' programming errors. Implications were drawn for both instruction and the design of COBOL compilers.

Content Determination through Program/Teacher Description

Determining the status quo for data processing programs at either the secondary or postsecondary levels has been one means of determining the content needs for data processing education programs. Current program offerings and characteristics of secondary data processing teachers have been described by Alexander (1973), Burgess (1972), Effarah (1977), G. B. Miller (1975), Rudolph (1972), and Smith (1974). Equipment limitations and lack of data processing work experience and course preparation have been considered major factors in restricting the amount of data processing instruction in business education programs. Separate courses in data processing are more likely to exist in large schools; units of instruction integrated into several business courses are more common.

Wagner (1973) identified high school business teachers nationwide who had been teaching data processing for at least one year and had some work experience in data processing. Opinions from this group of teachers were used to develop recommendations for a one-semester secondary data processing course and a data processing teacher-training program.

Saif (1975) identified the data processing competencies needed by teachers at the high school, junior/community college, and four-year college levels by asking both teachers and administrators at the three levels to rate competencies. Significant differences were identified in the required competencies at the three instructional levels. Work experience in data processing was more important at the postsecondary levels, but teachers at all levels needed hands-on experience with computers. Similar differences between secondary and postsecondary teachers' data processing content and inservice education needs were observed by Lambrecht and McLean (1977).

Other studies have developed recommendations for teacher preparation programs in business data processing by surveying secondary (Paulus 1972) or junior college (Reynolds 1971) data processing teachers on a statewide basis and comparing their perceptions of their preparation with their current teaching responsibilities. Other researchers have examined current business teacher preparation programs as a basis for developing other similar programs (Elliott 1970; Gloster 1974; and Schlapman 1969). Sherman (1975) identified the competencies judged important for data processing teachers by using the Delphi technique with high school teachers, junior college teachers, and data processing authorities. Significant differences were observed in the rankings of competencies by the three groups.

Three studies have examined the data processing program requirements for special groups of students. Lee (1977) examined the secondary and two-year college program modifications necessary for disadvantaged students. Special services, but not separate facilities, were found to be required to provide disadvantaged groups of students with the direct, practical experience necessary to gain data processing skills. Pellegrino (1971) identified evaluation instruments for measuring the affective components of a high school computer science program for disadvantaged students. Course recommendations were made on the basis of affective outcomes.

Another special group for which special data processing instruction has been proposed is undergraduate accounting majors. Reardon (1971) examined the kinds of arguments presented against the integration of data processing concepts into collegiate accounting courses. Willingness to integrate the computer into accounting classes was observed to be significantly related to accountants' experiences with computers, an attitude likely to change as the accounting profession has gained more familiarity with computer-based systems.

Teaching Methods

Nine of the seventeen studies evaluating teaching methodology have dealt with different approaches for teaching programming languages. Three of these studies have compared batch versus time-sharing systems for teaching FORTRAN at the high school (Bennet 1974) and college levels (Pinneo 1973; and Skelton 1971). At the college level no significant differences resulted on several achievement measures, such as time required to prepare the initial run, logic errors, time to get the correct solution, and a final achievement examination. Although Skelton observed significantly more syntax error rates on the time-sharing system, the conclusion of both studies was that either approach produced comparable achievement. Batch processing was recommended because of its lower cost. At the secondary level Bennet (1974) found that when small groups of students chose either time-sharing or batch processing to learn programming, time-sharing resulted in significantly longer programs and produced different achievement depending upon the type of problem programmed.

Self-paced and programmed instructional approaches have been compared with lecture-discussion (T. G. Phillips 1971) and computer-based display units (Witherell 1979) for teaching FORTRAN programming. Both concluded that either approach could be used to supplement class group instruction. Friedman (1973) developed programmed instructional materials for teaching RPG programming and determined that high school students could learn programming concepts more rapidly with the programmed materials, but that class discussion with visual explanation was still necessary. When instructional television was used by Bailey (1971) to teach programming, student attitudes improved toward the use of television in class.

The effect of teaching two programming languages in different sequences at the postsecondary level was examined by Cannon (1977) for FORTRAN and COBOL and by Knodel (1971) for FORTRAN and BAL.

Cannon found that the sequence of first learning COBOL and then FORTRAN resulted in greater positive transfer, but that final achievement was not different for four different treatment groups. Knodel also reported that achievement did not differ with the sequence in which the languages were learned, but that students preferred to learn the language they planned to use occupationally.

The introductory data processing course at the college level can be taught effectively through computer-assisted instruction (Rushinek 1979), but more effectively through lecture-discussion than programmed instruction (Fuori 1969). Programmed instructional materials for a high school unit on data processing concepts and terminology were found by Fagerstrom (1974) to increase student knowledge, but the materials were not compared with another instructional approach. When a six-day unit on data processing was taught through either student-managed or teacher-managed techniques at the high school level, no achievement differences resulted (Shannon 1978). On the other hand, the integration of data processing concepts into a high school accounting course improved student's data processing achievement and did not affect accounting achievement (Werner 1971).

The teaching technique of question asking was examined by Anderson (1974) after providing inservice training to data processing teachers in the use of Flanders' Interaction Analysis System. No significant achievement differences resulted for students who were taught the same data processing content by teachers applying different question-asking skills.

Teaching methods in the data-entry area have been evaluated by Sorrell (1977) using self-paced, individualized instruction compared to lecture-demonstration. Two teachers taught college-level students and obtained mixed achievement results. Speed and accuracy scores were higher for the lecture-demonstration approach, but cognitive test scores favored the self-paced approach. In either treatment, students with prior typewriting skills attained higher speed scores. Fields et al. (1978) compared four data inputting methods and found that the use of a menu to prompt correct entries resulted in more accurate input.

Prognosis in Data Processing

Nine studies have examined the use of different variables for predicting success in computer programming, general data processing course achievement, or job success. The Aptitude Test for Programmer Personnel (ATPP) and the Revised Programmer Aptitude Test (RPAT) have been used as one of the predictor variables in studies by Correnti (1969), Gray (1974), and Ritch (1973). The ATPP has also been used as a covariate in experimental studies by Fuori (1969) and Pinneo (1973); the PAT, as a covariate in experimental studies by Knodel (1971) and T. G. Phillips (1971).

Correnti and Gray have shown these specific programmer aptitude tests to be moderately useful predictors of programming course grades or graduation status. Ritch found the math portion of the Scholastic Aptitude Test to be a better predictor of data processing job success than the ATPP or the Otis Quick Scoring Mental Abilities Test. Sando (1973) found prior programming success and course grades in economics and accounting to be significant predictors of COBOL programming achievement as measured by an objective test.

Measures of cognitive style have been examined in studies by Beleutz (1974) and Cheney (1980). While the small groups of students in the Beleutz study preclude conclusions about the usefulness of Cognitive Style Mapping, Cheney found the identification of analytic or heuristic learning preferences significantly related to BASIC programming knowledges as measured by an objective test and a BASIC programming problem. Analytic decision makers tended to perform better on the examination than heuristic decision makers.

Three different tests of personality type have been used in studies by Barnes (1974), Remko (1976), and Robb (1974). Barnes developed personality profiles for programmer trainees and employed programmers using the Minnesota Multiphasic Personality Inventory, Strong Vocational Interest Blank for Men, and the Myers-Briggs Type Indicator. Remko found that the predictive significance of the Thurstone Temperament Schedule was different for men and women college students, though of low predictive value in either case. Robb found the ACT math score or total score better predictors of data processing achievement than the sixteen Personality Factor Questionnaire.

Analysis of Instructional Materials

Three studies have made comprehensive reviews and evaluations of data processing instructional materials. Rademacher (1971) determined the cognitive levels of the questions, exercises, and problems in twenty-four data processing fundamentals textbooks, seventeen programming textbooks, and thirteen systems analysis textbooks. Each type of textbook differed in the cognitive levels developed, as did the instructional objectives judged appropriate for computer fundamentals, programming, or systems analysis courses.

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Three different tests of personality type have been used in studies by Barnes (1974), Remko (1976), and Robb (1974). Barnes developed personality profiles for programmer trainees and employed programmers using the Minnesota Multiphasic Personality Inventory, Strong Vocational Interest Blank for Men, and the Myers-Briggs Type Indicator. Remko found that the predictive significance of the Thurstone Temperament Schedule was different for men and women college students, though of low predictive value in either case. Robb found the ACT math score or total score better predictors of data processing achievement than the sixteen Personality Factor Questionnaire.

Analysis of Instructional Materials

Three studies have made comprehensive reviews and evaluations of data processing instructional materials. Rademacher (1971) determined the cognitive levels of the questions, exercises, and problems in twenty-four data processing fundamentals textbooks, seventeen programming textbooks, and thirteen systems analysis textbooks. Each type of textbook differed in the cognitive levels developed, as did the instructional objectives judged appropriate for computer fundamentals, programming, or systems analysis courses.

Pharr (1977) developed a model for evaluating data processing textbooks and applied this model to thirteen commonly used textbooks. Readability levels were determined to differ widely as calculated by the SMOG Index and Flesch Index. The importance of data processing topics varied significantly from the secondary to postsecondary levels.

COBOL textbooks were analyzed by Franz (1977) to determine their similarity to the COBO used in typical business programming applications. Significant differences were found in profile of reserved word usage, and it was concluded that students might have a problem transferring the knowledge imparted by textbook example problems to the actual business programs which they might write or revise.

Summary

Most business data processing research has been directed toward the identification of appropriate content and assessing the current status of instructional programs. Relatively little attention has been given to instructional issues or learning processes in this field. As computing equipment becomes more readily available to business teachers, and as teachers become more familiar with the use of computers in several business subjects, teaching and learning practices will require more attention from researchers.

The availability of teaching materials at the secondary school level continues to represent a unmet need. The preparation of teachers who are knowledgeable in data processing content an teaching techniques will also continue to be a problem, especially as shortages of data processing personnel continue to be unmet in industry at large. As computers continue to permeate all aspects of individuals' personal and work lives, the integration of this tool into all business classes as an instructional aid will open further areas of curriculum development and research.

SHORTHAND AND TRANSCRIPTION

In the last twelve years, 164 doctoral dissertations or independent studies have been completed in the areas of shorthand and transcription. Of these, seventy-five (46.3 percent) have been identified as dealing with teaching methods. The next largest category of studies is shorthand prognosis, twenty-four studies or 14.6 percent. A total of twenty-three studies (14.0 percent) dealt with analysis of instructional materials or business vocabulary, and another twenty studies (12.2 percent) dealt with program evaluation, such as the comparison of different shorthand systems.

Gregg Shorthand has been the system most often taught in those studies involving the actual teaching of shorthand. Pitman Shorthand was the object of instruction or research in three studies (Laird 1971; Landroth 1977; and Paquette 1974); machine shorthand was included in two studies (Jacobsen and Borchardt 1980; and Robey and Burr 1975). Century 21 Shorthand has been the system taught in one study evaluating an individualized, media-supported instructional program (Sigler 1977). In addition, Century 21 Shorthand and several different alphabetic shorthand systems have been included in twelve studies that compared achievement between groups of students learning Gregg Shorthand and students learning other systems.

Two studies have compared the structure of the two symbolic systems, Century 21 and Gregg (Gallion and Kavan 1978; and B. J. R. White 1979). Condon (1977) has examined the occurrence of Gregg Shorthand theory principles in the most frequently used business vocabulary. Gregg Shorthand system changes were recommended based on the frequency of occurrence of theory principles.

The following are the types of research methodologies used in the 164 studies:

Research Methodology	Number	Percentage
Experimental	77	47.0
Descriptive Test Data Analysis	49	29.9
Mailed Questionnaires	17	10.4
Materials Analysis	15	9.1
Observation/Interview/ Critical Incidents	6	3.7
TOTAL	164	100.1

When testing of students was part of the research design, seventy of the studies (42.7 percent) included students beyond the high school level (technical school, community/junior college, and four-year college). High school students were the subjects in sixty-three studies (38.4 percent). In addition to these studies, ten (6.1 percent) included students at both the secondary and postsecondary levels. The remaining twenty-one studies (12.8 percent) did not include testing of student groups.

Problems in Shorthand Research

Before summarizing the research in several shorthand/transcription areas, some of the major research problems should be identified. While specific studies will not be critiqued, the frequency of several of the problems listed below indicates that the conclusions of many of the studies may not be adequately supported. Researchers should examine complete studies in areas of their interest.

The research design and analysis problems specific to the shorthand/transcription areas are the following:

Student Selection of Test

The most common problem encountered in shorthand research is that of allowing students to choose the dictation test that they will transcribe. Tests at several dictation speeds are dictated and students are asked to transcribe the speed(s) at which they feel they will be most successful. Several studies have supported the assumption that dictation tests even at the same dictation rate vary in their copy difficulty. Students transcribing tests dictated at the same rate may not be demonstrating comparable skill because of differences in the test copy. When students are allowed to choose their tests, analysis is being performed on scores affected by more than just differences in students' abilities. The resulting data analysis is ambiguous.

Retention of Only Highest Scores

Another common practice has been to accept only dictation test scores that meet a given accuracy standard, such as 95 percent. This practice is often coupled with that of allowing students several attempts at dictation tests and submitting their best test. The result of this practice is not only that different tests are submitted by different students, but also that students' scores are probably higher than their typical (reliable) performance. Their highest scores will have been attained on the easiest test copy. Another serious problem accompanying the practice of disregarding low scores is that some (perhaps many) students are excluded from the analysis. Research questions cannot be adequately answered when all of the relevant data are not included in the analysis.

Performing Analysis of Variance on Categorical Data

Related to the practice of collecting the highest scores from students is the analysis practice of comparing the highest dictation rates attained using analysis of variance. In categorizing students by their highest dictation rates, however, students are placed in a relatively small number of score categories, thus artificially restricting the true variance between students' scores. Further, averaging these speed levels amounts to incorrectly averaging categorical data. Because the dictation rates are fixed by the dictator, average dictation rate attainment between any two of the speed levels is a logical impossibility.

The true dependent variable for students taking dictation tests is either their "passing" or "not passing" classification within a speed category, or it is their actual accuracy score at a given speed. A "pass" or "no pass" classification requires nonparametic statistical analysis of the ordinal data. An accuracy score on a single dictation test, such as number of correct words or the percentage of words correct, is interval data for which analysis of variance would be appropriate.

Making Causal Inferences from Descriptive Data

Several studies in the shorthand area have made recommendations for teaching practices based on either questionnaire responses from teachers or observations of teachers in their classrooms. No experimental treatment is compared with a control group using the same valid and reliable testing instrument. While such informal observations or descriptions of classroom practices might be the basis for developing hypotheses about the effects of different practices on student achievement, the existence of these practices cannot be causally related to student achievement.

Lack of Reliable Information for Achievement Tests

A final area of research problems is that of not reporting reliable data for the dictation achievement tests administered to shorthand students. Frequently the difficulty of the dictation tests is not controlled to the extent this may be possible through control of vocabulary level and syllabic intensity. Inability to control copy difficulty might also be overcome by administering the same test to all students.

An administrative practice that diminishes test reliability is that of asking the several teachers participating in a research project to dictate the final achievement tests themselves rather than to place the dictation tests on tape. While the use of taped dictation is not without its own effect on student achievement, taped dictation does ensure that the dictation rate is the same for all students.

The following sections will briefly identify and in some cases summarize the shorthand/transcription research in the areas of the history of shorthand, the need for teaching shorthand and justification of vocational standards; program evaluation; prognosis of success in shorthand; materials analysis; teaching methods; and general program, teacher, or student characteristics.

Historical Studies

An historical documentation of research in shorthand and transcription was carried out by Barr (1971) and included both master's and doctoral research for the eleven years from 1957 through 1967. Perhaps because of the inclusion of master's studies, approximately two-thirds of the studies reviewed used the survey design in contrast to less than one-quarter being experimental.

A comprehensive history of the introduction, growth, and decline of Pitman Shorthand in the United States is provided by Landroth (1977), while Holcomb (1971) looked more broadly at the use of shorthand in American culture. Holcomb traces the use of shorthand in American society and the impact of this skill on present and projected career opportunities for shorthand writers.

The impact of one individual on the field of shorthand and transcription education is described by Burrington (1976) through a review of the contributions of Ruth I. Anderson.

A documentation of changes in shorthand instructional materials is provided by Bicanich's (1970) analysis of the forty-eight shorthand textbooks published prior to 1900. The emphasis on personal uses of shorthand skill and greater attention to writing accuracy over speed are in contrast to more contemporary teaching goals.

Shorthand Justification and Skill Standards

The justification for teaching shorthand is frequently sought through surveys of employers' needs and the comparison of office skills requirements with the curricula of various schools. Surveys by Ackley (1979), Barnes (1980), Cassidy (1973), B. S. Johnson (1979), Meinstereifel and Armstrong (1978), Scammon (1974), and Williamson and Houghton (1978) support the conclusion that shorthand skills are required by secretaries and other clerical workers in business offices. Minimum entry-level dictation skill requirements range from eighty to one hundred words per minute. The shorthand system used by office employees is not as important as their ability to type accurate correspondence. There are inconsistent reports of the use of shorthand in relation to machine transcription as well as inconsistent conclusions regarding possible salary advantages for shorthand writers.

More specific information regarding office skill requirements have been provided by studies that measure actual office dictation rates (Olinzock 1976) or administer common tests of office skills to both employed secretaries and students in stenographic programs (Hedley 1971). Olinzock recommended that multiple levels of standards be used in schools because the wide range of office dictation rates prevented the generalization that a single minimum rate was acceptable. Hedley's findings that employed secretaries performed better than either secondary or postsecondary students supported the conclusion that skill levels were likely to increase as a result of realistic employment experiences.

Lamb (1969) compared the office skill proficiency expectations of both teachers and employers. The proficiencies expected by teachers were generally higher than those sought by employers for entry-level employees. With regard to infrequently used, nonstenographic activities, Lamb concluded that on-the-job training may be more relevant than in-school preparation. In another comparison of office skill standards with classroom standards, Barnett (1972) found that employers and secretaries asked for transcription rates that averaged twenty words per minute higher than those expected by teachers. The performance standards used by teachers for grading varied considerably. Such differences of opinion are perhaps an indication of the difficulty of establishing performance standards without reference to specific testing instruments, job requirements, and student or employee capabilities.

Shorthand Program Evaluation

A total of fourteen studies have compared the achievement of students learning different shorthand systems in order to make judgments about the merits of one system over another. Five studies made comparisons between Gregg Shorthand and one or more alphabetic systems: Forkner Shorthand (Hadfield 1977; Lambrecht 1977, 1978, 1979a; and Whitman 1977); Stenoscript Shorthand (Hadfield 1977; Horlacher 1969; and Ritchey 1973), or Speedwriting (Landmark Shorthand) (Whitman 1977).

Two studies permitted comparisons between different alphabetic systems. Hadfield (1977) compared both Forkner and Stenoscript, and Whitman (1977) compared Forkner and Speedwriting.

Nine doctoral dissertations or independent studies have reported comparisons between Century 21 and Gregg Shorthand (Durso and Blair 1978; Heins et al. 1976; Higginbotham 1980; James 1979; Lambrecht 1978; Ownby 1976; Rollins 1980; Stoddard 1976; and Whitman 1977).

Generalizations about the findings and conclusions of the several studies are risky because of important differences in the design of each. One of these studies (Durso and Blair 1978) included random assignment of the shorthand systems to teachers and attempted to control the instructional procedures used. Most studies used a covariate to control initial student ability differences. One study examined second-year shorthand achievement at the high school level (Lambrecht 1978), and one examined fourth-semester achievement at the college level (Heins et al. 1976). The following are the conclusions that are supported by the several studies:

1. In all instances average student achievement at the end of one year did not meet the eighty word per minute dictation standard set as minimum vocational shorthand skill. This was true for both alphabetic and symbolic systems.

2. If only one year of shorthand was taken by students, average students achieved higher skill levels with an alphabetic system. Lower ability students seemed to benefit particularly from this option.

3. Century 21 Shorthand students are likely to achieve the same or possibly higher skill levels than Gregg Shorthand students within one year of instruction.

One study (Paquette 1974) compared student achievement for Pitman Shorthand and Pitman Shorterhand and determined that there were no significant differences between the two system versions. On the other hand, Robey and Burr (1975) used informal observations to make the judgment that machine shorthand was more effective than Gregg Shorthand for high school students. Laurie (1977) developed and evaluated a new symbolic shorthand, and an informal comparison was made of this new system with Gregg Shorthand.

Two studies have reported the follow-up of shorthand students after high school graduation. Lambrecht (1979b) reported that both Forkner and Gregg students were likely to use their shorthand skill for personal and vocational applications. Students who took more shorthand and/or who had greater skill were more likely to use their shorthand after graduating. Schultheis and Zuk (1979) reported that students who learned Gregg Notehand were also likely to be using their skill after completing high school.

Two studies have investigated the effect of shorthand instruction on students' English grammar and style knowledges. Both Johnson (1975) and Warner (1976) compared beginning shorthand students and high school students in regular English courses using the California Achievement Test for Language Arts. While Johnson found that shorthand students performed significantly better on punctuation, spelling, and vocabulary, Warner found no differences. Warner concluded that there is no assurance that incidental English style knowledges will result from learning shorthand.

Prognosis of Shorthand Success

Twenty-four research studies in shorthand prognosis continue to confirm that most teachers have available them in school student files or in easily administered tests ways to get student information that would aid in decision making. Information can be fairly easily obtained that would help teachers and students make more reasoned decisions about students' course enrollment and vocational plans. Not all test data are of equal value, of course, and some tests are more easily administered and interpreted than others.

In brief, the most promising predictive measures continue to be tests designed specifically for use in shorthand (Durso 1973; Hammers 1977; Handorf and Holderness 1972; Lambrecht 1971; Ranson and Smith 1971; and Skaff 1972). While not a specific shorthand aptitude instrument, the Modern Language Aptitude Test has been repeatedly shown to have moderately high correlation with shorthand achievement (Hayes 1969; Handorf and Holderness 1972; and Lambrecht 1971). Perhaps surprisingly, neither phonics instruction (Adams 1974) nor general phonics ability as measured by the California Phonics Survey has been shown to be significantly correlated with shorthand achievement (Bell 1971; and C. A. Smith 1975).

Another promising and easily administered shorthand aptitude instrument has been the Cloze reading test (Nennich 1974; and Ellington 1972). More general measures of reading ability have not been even moderately correlated with shorthand achievement (C. A. Smith 1975; and Nennich 1974). This suggests that the "word sense" required to supply the missing words in the Cloze test may be more closely related to shorthand dictation/transcription skill than general reading comprehension.

More general measures of academic ability are of low to moderate predictive value for shorthand achievement (Banks 1978; Hern 1980; Shane 1978; C. A. Smith 1975; and Utley 1970). However, measures of general cognitive style, such as Guilford's Structure of the Intellect instruments (Morton 1970) and Cognitive Style Mapping (Stencel 1974) have been of more value in differentiating successful and unsuccessful beginning shorthand students at the community college level. Classification by personality type as introverted or extroverted has also been shown to differentiate between successful and unsuccessful students in traditional or individualized shorthand programs (Hammers 1977).

Prior measures of shorthand skill are significantly related to later shorthand achievement (Foster 1977; and Utley 1970), and business English course grades (Hern 1980) and spelling ability are understandably related to shorthand transcription achievement (Morton 1970; and Nennich 1974).

Findings regarding personality measures have not been consistent, even though most teachers and researchers accept attitude and motivation as important deciding factors in students' school success. Hayes (1969) and Stewart (1975) both report little association between Cattell's Personality Scales and shorthand achievement. Handorf and Holderness (1972) confirmed that the personality measures on the Gordon Personal Profile are of less predictive value than specific shorthand aptitude tests. However, Reid (1971) judged the Gordon Personal Profile and Gordon Personal Inventory of some value in predicting students' level of job attainment and employers' evaluations of personality and attitude. Obtaining office employment was also judged by McCourt (1976) to be related to measures of general academic ability.

Other longitudinal measures such as success in passing the Certified Shorthand Reporters examination have been shown to be related to the general abilities of typewriting skill, reading, and goal orientation (Jacobsen and Borchardt 1980).

While less easily measured than verbal abilities, ear-asymmetry has been shown to be related to error scores on dictation (Bryja 1979). High school students appear to have a right-ear preference for the complex verbal skill of writing shorthand.

Shorthand Materials Analysis

A topic of recurring importance in shorthand research has been the identification of those factors that affect the difficulty of dictation copy. The validity of shorthand testing materials requires that they match the difficulty of business written communication. The reliability of shorthand testing materials requires that copy difficulty be known and held constant for tests that are to be comparable.

Two variables, vocabulary level and syllabic intensity, have been identified as significantly affecting copy difficulty. Vocabulary level is generally defined in relation to the most frequently used words in written business communication. Two research projects have sought to establish this vocabulary of frequently used business words (Perry 1968; and Mellinger 1972).

While vocabulary level has been shown to be directly related to the number of errors made on dictation tests (Smith 1970; Mickelsen 1970; and Wedell 1972), the accurate prediction of copy difficulty has not been possible. Henrie (1971) found use of the Hillestad difficulty formula more valid and reliable than three other formulas for predicting error scores, while Henshall (1971) found the Uthe formula more valid than four readability formulas for error prediction. Degner (1971) found the Uthe formula to be accurate in the prediction of copy of average difficulty. Boggess (1970), however, found no differences in students' scores when they wrote dictation copy predicted to be of varying difficulties based on the Hillestad formula.

Research by both Pullis (1974) and Nickerson (1977) has further confirmed that a range of copy difficulty levels cannot be accurately predicted using either three copy controls (vocabulary level, word length, and syllabic intensity) or a vocabulary index based on the frequency of word occurrence on the Perry vocabulary list.

Other recent research has been more successful in isolating both vocabulary-level controls or syllabic-intensity levels that are related to copy difficulty. Thomason (1979) was able to develop parallel dictation tests based on changes in vocabulary level. Differences in copy difficulty resulted when Perry word frequency categories were changed by 15 percent increments. Syllabic intensity, brief forms, and number of different words were held constant. Perry (1980), on the other hand, has determined that while syllabic intensity is related to copy difficulty, that relation is not a linear one. When vocabulary level is held constant, dictation tests of both low and high syllabic intensity are more difficult than tests of mid-range syllabic intensity.

When testing and instructional materials have been compared to written business correspondence on the basis of vocabulary level, syllabic intensity, and readability level, significant differences have been reported (Nickerson 1977; Pullis 1976; Reese and Smith 1976; and Warner 1975). Dictation testing materials have also been shown to vary considerably in vocabulary level and syllabic intensity (Pullis 1977). These differences in copy are further illustrated by the low parallel-form reliabilities of tests at the same dictation speed (Pullis 1978).

In contrast to these findings for symbolic dictation tests, Cyrus (1977) has substantiated the validity of the dictation tests on the New Jersey Certified Shorthand Reporter's examination by showing that their syllabic intensity is not different from the syllabic intensity of New Jersey courtroom transcripts.

Shorthand Teaching Methods

Research related to shorthand teaching methods will be summarized in the general areas of shorthand theory development, reading, homework, speed building, transcription, and general teaching approaches.

Shorthand Theory

A total of twenty-five studies have examined issues and practices related to teaching the theory of a shorthand system.

A continuing issue in shorthand research has been the relationship between shorthand theory knowledges and dictation/transcription skill. Four studies have confirmed that there is a positive relationship between students' theory recall knowledges and their ability to write and transcribe from dictation (Dortch 1976; Howard 1968; Karaim 1968; and Pullis 1979 and 1980). Two studies at the high school and postsecondary levels have further shown that an emphasis on the correct writing of shorthand outlines (Newell 1978) and the use of shorthand theory tests (Levine 1980) do tend to result in higher dictation skill attainment.

In addition to the use of theory tests, special reading, writing, and dictation materials have been developed to review and reinforce theory knowledges systematically. Conerly (1975) and Olsen (1974) prepared materials that used additional brief forms for Gregg Diamond Jubilee Shorthand. J. N. Jones (1975) prepared materials to provide spaced repetition of both brief forms and selected theory principles. Hallman (1971) and Cole (1975) also developed supplementary materials to review certain Gregg Shorthand theory principles. The general conclusions from these several studies have been that the supplementary materials increased the accuracy with which students wrote the particular theory principles emphasized and that dictation skill was either not affected or was improved by the theory review.

Other approaches to improving theory knowledges have included the systematic inclusion of frequently-used business words in the specially designed instructional materials. Difficulty of instructional materials is thereby controlled, and students are exposed to common business vocabulary. Three studies (Hooven 1978; Humphrys 1970; and Rice 1975) have shown significant differences in dictation skill attainment favoring the groups using the vocabulary-controlled materials.

The use of programmed and media-supported theory instruction has been evaluated in nine studies (Byrd 1969; DeYoung 1971; Fields 1973; Gilmore 1976; Lipman 1976; Rice 1975; Shank 1972; Sigler 1977; and Simcoe 1975) including both the secondary and postsecondary levels. Findings have not been consistent, and numerous teacher, student, and procedural variables undoubtedly account for the differences. Programmed and self-paced instructional situations have been most effective for higher-ability students and those who already have some knowledge of the shorthand system.

Two studies have looked in more detail at the psychological processes involved in learning the sound-symbol associations required for writing shorthand. Sprenger (1970) examined the effects of different block sizes in learning Gregg Shorthand and the effect of using mnemonic aids. Smaller block sizes and mnemonic aids promoted faster initial learning, but no significant differences were obtained on forty-eight-hour recall tests. Borman (1971) used computer-assisted instruction to examine the proposition that incorrect responses decrease the efficiency of the

associative learning process. An interception method that prevented errors was compared with three other treatments; retention tests on the recall of thirty shorthand symbols showed inconsistent differences among the treatments. None of the treatments, however, included written responses to spoken sounds, the key response to be learned in shorthand.

Reading Ability and Dictation Achievement

Both Beringson (1971) and Pullis (1972) have shown a positive relationship between shorthand reading ability and shorthand dictation skills for high school and postsecondary students. Instructional procedures for incorporating reading activities into classroom instruction have been evaluated by Clippinger (1978) and Osborn (1970). While Clippinger found few significant differences favoring a treatment that incorporated reading (spelling), recycling of text material, and tracing from dictation, Osborn concluded that dictation skills were improved as a sense was added to the reading process. Of three experimental treatments, reading of vocabulary-controlled shorthand outlines while listening to the dictation and scribble-writing had the highest relation to dictation ability.

Shorthand Homework

Ten studies have examined the use of various homework practices at different levels of shorthand instruction. Several studies have shown no significant differences between the traditional method of reading and self-dictation from textbook shorthand plates and such practices as the following: using workbooks (Rittenhouse 1968); listening to taped dictation and spot-writing (Lund 1973); extensive reading before writing (Toulouse 1971); in-class practices of reading, writing from the printed transcript, and spot-writing from taped dictation (Forte 1975); and a combination of reading with a reading goal, writing from taped dictation, and writing from both shorthand plates and the printed transcript (Mansfield 1978).

On the other hand, significant differences have been found at the high school level favoring the practice of reading using a reading goal and writing only student-selected outlines (Perry 1974). At the college level the practices of writing from taped dictation (Hess 1969; and Pankhurst 1972) and writing from printed copy (B. E. Arnold 1974; and Hayes 1971) have been judged to be more effective than self-dictation from shorthand copy. Writing from printed copy was particularly effective when the material contained a broader, more difficult vocabulary than textbook materials alone.

Shorthand Writing Speed Development

Twenty-two studies have examined speed building practices in shorthand. Use of the micromolar or constant-rate dictation plan has been evaluated by Berch (1977) and Langemo (1972). Berch found a base micromolar rate of eighty words per minute more effective than the traditional dictation plan for adults who already had some knowledge of shorthand. Langemo, however, found no significant differences with groups of high school students when the micromolar (fast-cue response) base rate of 120 words per minute was compared with a traditional dictation plan.

While using traditional dictation plans, Dye (1970) compared the use of dictation rates 0-20 or 20-40 words per minute above current writing levels of college students. There were no achievement differences for either skill building dictation plan. Lawrence (1974) compared an

"Equi-Code" method of pacing dictation with the traditional use of a standard word of 1.4 syllables. The "Equi-Code" method paced dictation according to the number of shorthand strokes in a word outline rather than syllables. Significant achievement differences favored the "Equi-Code" method.

Other external events that may affect dictation achievement were examined by Dickey (1976) and Gillis (1974). Performance is improved and anxiety lessened by announcing dictation rates prior to dictation and preventing the occurrence of loud noises or other distractions during dictation. Provision of outline previews before dictation for second-semester or intermediate shorthand students was examined by Merrier (1979) and Soellers (1973). Merrier applied the treatment of previews or no previews for twelve weeks and found no significant achievement differences for students on nonpreviewed dictation tests. Soellers, on the other hand, applied three preview plans on the achievement tests (no previews, 5 percent of words previewed, 10 percent of words previewed) and found that a 10 percent preview benefited the lower achieving students.

The mechanical aspects of students' penmanship were examined by Kocar (1971). The size of students' notes and their deviation from model outlines varied considerably, and this variation was not related to achievement.

The effect of the content or difficulty of shorthand dictation copy on speed attainment has been examined by A. R. Anderson (1969), Boggess (1970), and McIntosh (1970). Anderson found that the use of dictation copy controlled by vocabulary level plus tracing resulted in consistently higher, though not significantly higher, dictation achievement than regular textbook dictation coupled with preview lists. Boggess, however, found no differences in dictation achievement when practice was carried out on materials judged to be of four difficulty levels. McIntosh found higher ability students to benefit from dictation practice on nonrepetitive copy.

The use of taped dictation for in-class skill building practice has not been found to result in higher achievement for either Gregg (Hess 1969) or Pitman (Laird 1971) shorthand students. The lack of significant differences in achievement suggests that taped dictation may be used as effectively as teacher dictation. Taped dictation makes provision for individual writing differences among students, but can also become boring if used as the primary source of dictation.

Similar lack of speed achievement differences was found by Fennel (1970) in using a visual pacing device to present shorthand outlines to students for self-dictation.

Several studies have examined the shorthand dictation testing process in an attempt to assist teachers and researchers in student skill evaluation. Gallion and Kavan (1980) have confirmed findings of several earlier studies that students transcribe the same number of actual words on dictation tests at different speeds. This suggests the desirability of using tests at a single dictation rate in order to rank students by skill level.

To assist teachers in determining grading scales for dictation tests of different lengths or rates, Kimbrel (1973) examined changes in transcription accuracy scores when the length or rates of dictation varied. Prigge (1971) developed regression equations for the prediction of dictation accuracy on longer dictation tests or tests at higher dictation rates from known accuracy scores on shorter or slower tests.

The ability of teachers to predict errors on dictation tests has been questioned by Pullis (1973), however. A small group of advanced, college-level shorthand students wrote the same five-minute, 100 word per minute dictation test twice with one week between administrations.

Only 28 percent of the errors on the second administration were the same errors as on the first test. While correct shorthand outlines tended to be transcribed correctly, the occurrence of outline and transcription errors appeared to be random. Errors tend to increase, however, when transcription is deferred as opposed to transcribing immediately after writing the dictation (Pullis 1971).

The use of either three- or five-minute dictation tests has been examined by Crandell (1969) and Pullis (1970). Crandell found that different groups of students had similar accuracy levels on three- or five-minute dictation at the same dictation rates. The three-minute test was judged to be as accurate for measuring skill as five-minute dictation. Pullis compared three- or five-minute speed attainment levels for a single group of students. The speed levels passed with 97 percent accuracy were approximately sixteen words per minute faster for the three-minute tests, but the correlation between speeds passed on three- or five-minute dictation was r .71. Either test could be used to rank students by skill level.

Shorthand Transcription

While the accurate transcription of shorthand dictation is the primary objective of shorthand instruction, only nine studies have examined teaching practices in this area. Both Hampton (1971) and Keller (1973) have examined the effect of introducing transcription instruction at different times during the first year of shorthand instruction. Both concluded that the time at which formal typewritten transcription instruction is introduced has no effect on dictation and transcription achievement.

The need to teach typewritten shorthand transcription as a separate task different from longhand transcription has been suggested by McLean's (1978) intercorrelation of several longhand and shorthand transcription speed and accuracy scores. The few significant relationships indicated that good longhand typewriting skills will not automatically transfer to good shorthand transcription skills. Further supporting the need for shorthand transcription instruction, Devivo (1972) compared machine and shorthand transcription and concluded that transcribing from correctly written shorthand outlines was more difficult than transcribing from machine dictation.

The following effective instructional practices have been identified for transcription instruction: special transcription drills in conjunction with early typewritten transcription instruction (Haney 1976); the use of slides for developing transcription speed (McGuire 1970); and the use of programmed instructional materials for reviewing punctuation (Perkins 1970).

In examining shorthand transcription evaluation practices, Tronsue (1969) has concluded that transcription speed is affected by the interrelationship of several independent variables: immediacy of the transcription after dictation, the speed of dictation, and the style of writing in the dictation copy. Robinson (1970) has also shown that transcription test scores will improve as students become familiar with the testing format, content of the tests, and the testing environment. A single testing session is not likely to represent typical student performance.

General Shorthand Teaching Methods

Nine studies have looked at shorthand teaching methods in a broad sense. Ashby (1971) used the critical incident technique and Prather (1974) the Delphi technique to determine

teaching requirements or competencies for shorthand teachers. Busch (1974), Crump (1970), Skabo (1968), and Wedell (1978) used observations, interviews, or questionnaires to identify effective teaching practices in first-year shorthand.

Hanrahan (1973) has demonstrated that beginning shorthand classes can meet either three or four times a week with no achievement differences, but that four class meetings a week are better than three for intermediate shorthand at the college level. At the high school level Hartman (1970) has shown that beginning shorthand and beginning typewriting can be taught in the same class with specially designed instructional materials. Shorthand may also be a vehicle for second language learning for adults (Handy 1977).

General Program and Student Characteristics

Six studies have examined selected characteristics of either shorthand programs, students, or teachers. Grever (1975) compared shorthand programs in community colleges and four-year colleges and determined that community colleges were likely to offer shorthand instruction for more credits and longer meeting times, to make more use of listening laboratories both in and out of class, and to have different grading standards from four-year schools. Ward (1975) identified some of the recruiting practices that high schools used to attract academically talented students into shorthand classes. Hosler (1976) surveyed Wisconsin secondary schools to determine the use of multichannel dictation laboratories. Almost three-quarters of the schools used some form of playback equipment in shorthand classes, particularly during the second semester of instruction.

Gaskin (1972) compared teachers' shorthand skill competencies with the achievement of their students and found that there was no significant difference in students' achievement when they were taught by teachers possessing varied skill competencies. The use of language by shorthand teachers and students was examined by Petersen (1971) in terms of the pedagogical meaning transmitted and the contextual meanings contained in the words. In contrast to this language analysis, Egry (1976) analyzed the phonic abilities of high school shorthand teachers and students using the California Phonics Survey. Phonic deficiencies were identified in both groups, 85 percent of the students and 33 percent of the teachers.

Summary

Whereas most shorthand/transcription research has concerned teaching methods, little attention has been given to the fundamental concepts or psychological processes required for the development of shorthand writing skills. Virtually no attention has been given to teaching methodology for machine shorthand, alphabetic shorthand systems, or personal note-taking skills.

One-third of the studies related to teaching methods have been directed to the development of shorthand theory knowledges. In contrast, few studies have examined methods for teaching shorthand or machine transcription. Since the development of high levels of transcription skill is necessary for either longhand, voice, or shorthand transcription, this is an area likely to receive greater research attention as voice transcription is used more in industrial word processing settings.

TYPEWRITING

A majority of the research on typewriting reviewed for the period 1968 through 1980 involves typewriting methodology, with an emphasis on individualized instruction. Other areas of attention during that period were the identification of content objectives, student characteristics, education level, instructional materials, technology, and evaluation. In addition, Hamilton's 1976 study analyzed and synthesized research findings in typewriting for the period 1949-1960.

In preparing this report, 136 studies were reviewed. The majority of these (ninety-three or 68.4 percent) used experimental design. Thirty-nine (28.7 percent) of the studies were descriptive, and four (2.9 percent) were historical. The descriptive studies included questionnaires, observation, material development and/or analysis, and test development/analysis.

The largest number of studies involved typewriting methodology. Although most studies involved students at the secondary level, elementary, postsecondary, adult, and special needs students were also researched. Individualized instruction was the topic that received the greatest attention.

Identification of Content Objectives

Twelve content-related business education research studies were reviewed.

In 1968, Mukomela analyzed over 2,000 business letters to determine their structure and design. He concluded that the design and structure differed and that they were influenced by factors such as the size of the business in which the letter originated.

Wise (1968) compared materials typed by Denver, Colorado office workers with the production materials contained in high school typewriting textbooks. Based on this research, Wise recommended that the content of typewriting textbooks be changed with respect to the percentage of material devoted to unusual words, digits, tabulations, manuscripts, memorandums, and letters. Specific guidelines were presented.

In 1970, Stewart analyzed typewriting activities in insurance offices. These activities were compared with the activities in two typewriting textbooks. The time devoted to typing forms, straight copy, and personal correspondence was compared. Information on the way in which material was received and the copying methods used was also presented.

A study similar to those conducted by Wise and Stewart was conducted by Ober (1974). His findings supported Wise's recommendation that materials in typewriting textbooks should be changed to meet industry conditions more nearly. Like Stewart, he provided information on the way in which typists received work and the way in which copies were made. He also investigated and reported on the equipment that was used and the extent to which office workers composed correspondence.

D'Onofrio (1976) surveyed Connecticut teachers and their students to determine their perceptions of the work being performed by beginning office workers. The data gathered from teachers and students were compared with each other and with the results of the Ober study. Several similarities and differences between teachers' perceptions, students' perceptions, and Ober's research findings were noted.

The most recent study dealing with typewriting course content was conducted by Guffey (1980). A comparison of the results of this study with those of Wise, Stewart, and Ober revealed a change in the percentage of time office workers devoted to various typing tasks. Agreement existed in the way material to be typed was received, with the majority of work coming to the typist in handwritten or rough draft form. The Guffey study also reflected the influence of technological changes on methods of making corrections and methods of making copies of typed work.

Can economic concepts be taught to typewriting students by incorporating those concepts in drill work and timed writings? Yes, according to research conducted by Bell (1972) and Feese (1976). Both researchers found that students who were exposed to economic concepts through typewriting copy increased their knowledge of economics without sacrificing typing skill. The Bell study was conducted at the middle school level; the Feese study was conducted at the high school level.

Dawley (1973) explored a similar topic from another angle. In her experiment, one group typed copy containing economic concepts with no special instructions to concentrate on the copy. The other group typed the same material but received special instructions to read and concentrate on the material contained in the timings. She found that the group that received special instructions learned significantly more economic concepts and also achieved a significantly higher speed gain.

Fews (1969) also conducted research to analyze intentional and incidental learning in typewriting classes. She concluded that a significant mean gain score in business vocabulary was achieved when typing students spent a portion of the class typing paragraphs in which the meanings of business words were obvious from the context. The normal progress of students using materials containing word definitions was not hindered; production scores increased.

In 1975, Foust analyzed the activities of production typing and developed a teaching model and standards. Based on her findings, she recommended that more instructional time be spent in teaching decision making, proofreading, numeric copy, tabulation copy, and longhand copy.

Ruetten (1976) found that the Developing Communication Skills with the Typewriter method had a positive effect on reading skills of tenth grade students. No significant differences in spelling or vocabulary were found.

Characteristics of Students and Educational Level

Several business education studies have been conducted in this area. The largest number of them has dealt with students with special needs.

The first of the studies during the period under consideration was conducted by Freedman (1968). This study explored the relationship between selected variables and success by blind transcriptionist trainees. Freedman concluded that, of the variables he examined, spelling ability, age, verbal interest, digital span, and time unemployed had the greatest relationship to transcription success. He also concluded that above average intellectual functioning had previously received too much emphasis as a success factor.

Wonderling (1971) also researched blind typewriting students. He found that, among the high school typewriting students in residential schools for the blind with whom he worked, the greatest number of typescript errors occurred in the category of substitutions; the smallest

number of errors was in word division. He also found that students made more errors when typing from braille than when typing from dictation. A significant relationship existed between the number of errors made and the number of technique deviations.

In 1977, Rosenberg investigated the relationship between the self-concepts of physically handicapped young adults and their achievement in typewriting. She discovered that no significant relationships existed.

Gladis (1970) conducted an experiment to determine the influence typewriting has on educably mentally handicapped students in the areas of language arts skills and motor development. She found that no significant differences existed in vocabulary development. The group using electric typewriters to complete their lessons had higher adjusted mean scores in reading and spelling. The group using typewriters also performed significantly better on two of fourteen motor development subtests.

An experimental program for job preparation in beginning typewriting proved successful in helping potential student dropouts remain in school. The results of this study, conducted by Kirk (1973), indicated that beginning typewriting had a lower dropout rate than other courses, especially when the course was taken early in the high school career. Although the students who took part in the program did not possess a typewriting skill sufficient to compete with students in a regular class, they did make continual improvement.

In 1974, Curlott compared an audiovisual method and the traditional method of teaching typewriting to disadvantaged students in a mobile unit. No significant differences were found in speed, accuracy, or student attitudes.

In another study about typewriting and disadvantaged students, Fant (1969) found that the talking typewriter was useful in helping disadvantaged adults improve in the paragraph meaning aspect of reading. Students not exposed to the talking typewriter improved in word meaning and paragraph meaning.

The typewriter was a valuable instructional aid for elementary students as they studied language arts, according to Schulze (1973). He found that those students who used a typewriter made significant gains in reading, language arts, and creative writing ability.

In 1970, Buchl surveyed department chairpersons of over 300 high school business education departments in school districts where junior high school typewriting was available. The purpose of the survey was to determine the articulation procedures used. He found that approximately one half of the schools surveyed had advanced placement programs. An examination consisting of a timed writing, production work, and typing of numbers by touch was the method most chairpersons believed should be used; the majority indicated, however, that placement by number of semesters of typewriting completed was the method they used at that time.

Nord (1976) analyzed selected elements in first-year typewriting in American high schools and found that there were more similarities than differences. Nine-month school terms with classes meeting under traditional scheduling were most common. Five-minute timed writings were given most often, and one error per minute was the favored accuracy standard. No agreement was shown on speed standards for timed writings, however.

Manifest anxiety and its influence on speed and accuracy in first semester typewriting was the topic researched by Ehley in 1970. Using six student groups (two where seating was unarranged, two where seating was based on similarity or difference in typing speed, and two where seating was based on similarity or difference in anxiety), he found that the only significant overall difference occurred in favor of one of the unarranged seating groups. This group's speed improvement was significantly greater than the speed improvement of the group seated by differences in speed. No other overall speed or accuracy differences were found; some differences based on anxiety level were indicated.

Harrington (1970) examined the relationship of hand and finger configuration to straight-copy achievement in typewriting. Numerous findings relating to hand-finger size, sex, and kind of typewriter used were presented.

The only study conducted during the 1968-1980 period that dealt with teacher characteristics was one completed by Frederickson (1974). The study explored student perceptions of three nonverbal teacher behaviors as demonstrated by male and female teachers. The factors of invasion, touch, and eye contact yielded different responses from male and female students and were viewed differently when combined than when examined separately.

Instructional Materials/Technology/Methodology

This section will be presented in three parts, as indicated by the title. Within each part, those items that deal with similar topics will be grouped and summarized. This will be followed by an alphabetic listing/summary of those studies for which no grouping is possible.

Instructional Materials

Copy difficulty was a topic studied by Beaumont (1969), Diehl (1972), and Erickson (1975b). Beaumont found that balanced-hand stroking and one-hand stroking were significant factors in copy difficulty. Diehl reported significant differences among typists of high, average, and slow speed and accuracy when extreme variations of syllabic intensity were used in straight-copy typewriting materials. Erickson's research showed that speed decreased as copy difficulty increased, that accuracy was not consistently affected by copy difficulty, and that easier copy did not consistently result in higher net-words-per-minute scores.

Long (1977) researched the effectiveness of ordinary prose copy and contrived copy upon the development of key-stroking skill. Based on her findings, she concluded that either prose or contrived copy can be used effectively for skill building in initial stages of typewriting.

An earlier study by Prater (1976) revealed students who did no drill work following a three-minute timed writing did significantly better on the timing than those who typed drills from computerized drill books, paragraphs from magazines, or textbook drills.

Bennett (1980) developed and evaluated self-paced materials for a postsecondary course on the IBM Memory typewriter. All units that were created were tested and revised until they met the 90 percent achievement criterion that had been set.

Hilgedick (1976) found that no significant differences in gross words per minute or accuracy existed between beginning typewriting students who used proof guides as an instructional aid and those who did not.

McLean (1971) determined difficulty indices for office typing tasks. His research yielded eighteen useful equations. In addition, the following relationships were shown: little between intelligence and typing proficiency; little between ordinary copy skills and proficiency at realistic office typing; nearly none between speed and accuracy; and low to moderate between various office typing tasks. He recommended that increased emphasis be placed on realistic typing tasks.

Santiago-Perez (1977) compared typing achievement of students using special Spanish materials and students using those materials that had been adopted by the schools at the time the experiment was conducted. She found that no significant differences existed in the number of errors made. She also found that no significant relationship existed between speed and accuracy in typing performance. Showel (1974) compared alternative media for teaching beginning typists and found that the most effective programs tended to be those that minimized detailed instruction during keyboard learning and made extensive use of forced pace typing during skill building to emphasize speed. The study was conducted in an Army training setting.

Suri (1977) developed a typewriting manual for teaching standard English grammar to community college students whose writing showed evidence of linguistic interference from nonstandard dialects. Each chapter included repetition, recall, substitution, completion, transformation, editing, guided writings, composition exercises, and a comparision of standard and nonstandard features to be concentrated on in the chapter. The content validity was affirmed.

Technology

Cook (1973), Guyot (1973), Shaffer (1976), and McKown (1979) explored the effect of electronic devices upon achievement in typewriting. Cook's research showed that students who learned the keyboard by the traditional method typed faster than those who learned by the electronic keychart method. However, the opposite was true for accuracy; the keychart group was more accurate than the conventional typewriter group.

Among ninth grade students who learned the keyboard by traditional and wallchart methods, no significant differences were shown (Guyot) in speed, accuracy, or number copy speed. College students who used the keychart to learn the typewriter keyboard (McKown) showed no significant difference in keyboard mastery when compared to those who learned the typewriter keyboard by traditional methods.

Shaffer (1976) compared the simulator to the conventional classroom method of teaching the keyboard and concluded that the simulator was not more effective than conventional instructional methods. In addition, she found that motivation, previous manipulative experience, and motor development were not good predictors of typewriting performance.

A slide projector-tachistoscope device was the subject of research conducted by Hille (1977). No significant differences in speed or accuracy were shown between the groups in the experiment.

Kupsch (1975) studied the effectiveness of sound-slide packages in beginning collegiate typewriting. Significant differences were shown in typing knowledge and concepts in favor of students using the sound-slide packages. No significant differences in timed writing speed or accuracy were found.

Maestas (1979) found a significant difference in favor of those receiving traditional instruction when compared with those taught using a synchronized bilingual sound-slide package.

Matthews (1971) investigated the effect of the Magnetic Tape Selectric Typewriter (MT/ST) and group instruction on achievement in a high school honors program. Three groups were created: one received the regular program, instruction on the MT/ST, and discussion after each MT/ST lesson; one group received the regular program and MT/ST instruction without discussion; the final group received only the regular program. The group receiving MT/ST training and discussion in addition to the regular program achieved learning scores significantly higher than the other two groups.

Radin (1979) developed and evaluated a computer-based typewriting diagnostic program. The diagnostics included identification of seven different types of errors, observations of omitted and adjacent characters, and observations of particularly slow inter-character latencies. Hints for improvement were generated, and feedback was made only on those errors that were made consistently.

Trexler (1972) found that the Gregg/Pacesetter and traditional instructional methods were equally effective in developing speed and accuracy in beginning typewriting at the secondary level.

Quiring (1979) traced the history of the typewriter and described it in three eras: Early Inventions (1714-1867), Later Inventions (1869-1932), and Current Manufacturers (1933-1977).

Wiper (1969) conducted an experiment in typewriting which utilized specially designed audiomonaural equipment for skill building in collegiate intermediate typewriting. No significant differences between groups were found.

Methodology

From 1968 through 1980, more research was conducted in the area of methodology than any other aspect of typewriting. The most widely researched topic was individualized instruction.

The first of these studies was conducted by Warner (1969), who utilized programmed instructional materials and tape recordings in teaching collegiate intermediate typewriting. He found no significant differences in achievement among groups taught by traditional, combination tape/teacher-directed, and programmed instruction methods.

In 1971, Thoreson conducted an experiment to determine the validity of individualized large-group, multimedia instruction compared with traditional instruction at the high school level. His results showed that the multimedia group typed significantly faster on straight copy and production. The traditional group was significantly more accurate on straight copy. The multimedia group was, however, significantly more accurate on production.

Another study, conducted by Kline in 1971, compared the achievement and attitudes of middle-school students taught in a self-directed program with those taught in a teacher-directed program. No speed or accuracy differences were found; no differences in attitudes were shown. A significant difference in technique in favor of the traditional classes was indicated.

Lauer (1972) evaluated the effectiveness of using business department prepared videotapes in teaching collegiate typewriting. In his experiment, the group using videotapes achieved higher rates during one quarter in letter gross words per minute and in combined quarters in statistical tabulation gross words per minute. This group did, however, make significantly more errors during one quarter and during combined quarters on straight copy.

The results of a study conducted by Frye (1972) concurred in part with the results of Thoreson's study. Frye, who worked with college students, found that students taught by a multimedia instructional approach typed faster on straight copy than students taught by traditional methods. Her research also showed that the multimedia group typed certain production activities with fewer typographical and form errors.

Varnon (1973) compared self-paced, programmed instruction and teacher-directed nonprogrammed instruction in problem typewriting at the high school level. The results of her study showed no significant differences in production form scores. Significant differences in speed were found for the programmed instruction group, but significant differences in accuracy were found in favor of the teacher-directed group.

In 1973, Klemin compared achievement and attitudes in the individualized progress method and traditional method of teaching intermediate collegiate typewriting. The findings indicated no significant difference with respect to treatment groups, teachers, and method-teacher interaction on all overall achievement measures on four of six learning units tested or on twelve of sixteen attitude questions.

McNair (1974) was another business education researcher who compared traditional and self-directed approaches to teaching typewriting. No significant differences were found for completion time or typographical errors. Significant differences were noted in form errors; the traditional group made fewer errors.

The results of a study by Toy (1975) supported the findings of Warner and disagreed with the findings of Frye. She found no significant difference in terminal achievement or attitudes between students taught by the individual progression and traditional methods at the collegiate level.

Anderson (1975) compared the time spent by traditional and audiovisual tutorial students in learning to type. The audiovisual tutorial group spent significantly less time attaining the speed objective. Neither triple nor double interaction among learning method, ACT scores, and sex was significant to time spent attaining speed objectives.

Seventh grade beginning typists were participants in Rhea's 1975 research study. The achievement of students receiving individually paced instruction was compared with the achievement of students receiving traditional instruction. Rhea found that technique scores at weeks six and fourteen were significantly better for the traditionally taught group. (This agrees with Kline's findings.) No significant differences were shown in speed. The individually paced students made significantly fewer errors.

Sherrill (1975) compared three typing-training methods: conventional Army method, commercially vended programmed instruction involving pacing devices, and individually paced practice. The result was that the average difference in mean improvement in performance among treatment groups was not significant.

In 1976, Beard compared self-paced printed programmed instruction in problem typewriting at the postsecondary level. She found that the multimedia group did significantly better in production speed. No significant differences were shown in production accuracy.

The Wolcott study conducted in 1976 examined the effect of computer-assisted instruction, traditional instruction, and locus of control on achievement of beginning typewriting students. The results of the study indicated that the traditional group did better on five-minute timings, but no effect on locus of control was shown. Achievement on production tests was not significantly affected by mode of instruction or locus of control. No significant interaction was found on five-minute timed writings and production tests between mode of instruction and locus of control.

In 1977, Blucas surveyed instructors of individualized typewriting in public community colleges to secure their opinions on the importance of selected individualized instruction activities. From his research, Blucas found that individualized instruction is used more by large community colleges than small ones. The majority of respondents indicated the decision to use individualized instruction was made by the faculty. The method of instruction is used mostly in beginning typewriting courses.

Lugo (1977) examined the effectiveness of individualized instruction in teaching elementary typewriting in higher education in Puerto Rico. She concluded that elementary collegiate typewriting could be taught effectively by individualized instructional methods.

Stearns (1978) compared the effect of using self-paced multimedia programmed instruction with self-paced printed programmed instruction in teaching number typewriting. She also considered the effects of reading and listening abilities. Both methods were found to be equally effective in developing number skill. No differences based on reading or listening ability were found.

Adams (1978) studied the effect of vocabulary load on high school beginning typewriting achievement in a self-instructional learning context. No significant differences in straight copy-speed gains were found between or within groups or in interaction. A significant difference for the group that received instruction via materials rewritten by the researcher for lower level readability was shown on accuracy gains between groups. No significant difference was found in accuracy within groups or in interaction effects.

A 1979 study conducted by Spring compared teacher-directed conventional and student-directed competency-based approaches to teaching typewriting at the two-year college level. He concluded that competency-based instruction was more effective in developing straight-copy speed. The teacher-directed approach was determined to be more effective in developing production speed and yielded fewer form errors. As in other studies, no attitude differences were found.

Another study dealing with competency-based instruction was conducted by McKinney in 1975. The purpose of the study was to develop and pilot a competency-based method of instruction in two advanced collegiate typewriting classes. Comparisons were made between those students who had less than two and those students who had two or more years of previous typewriting training. No significant differences in achievement were shown. In addition, no significant differences were found in the amount of time needed to achieve mean standards set for the competencies.

Three business education research studies dealt with the typewriter keyboard and methods of instruction.

A. Johnson (1971) compared a simultaneous and nonsimultaneous approach to presenting the alphabetic and numeric typewriter keys. She found no significant differences in speed or total errors on alphabetic copy, technical copy, and number copy. In addition, no significant differences were shown in percentage of error on alphabetic and technical copy.

Riar (1974) conducted an experimental study in teaching beginning typewriting by using combinations of alphabetic letters as typed by expert typists. Significant differences between the mean speed scores were in favor of the group given instruction using combinations of alphabetic letters. The control group experienced better results on accuracy during the earlier part of the experiment; the experimental group performed better during the latter part of the experiment.

In 1978, Lessley explored the topic of keyboard retraining. The participants were retrained from the QWERTY to the Dvorak keyboard. No significant differences in speed on straight copy were found between those retrained who used CRT equipment and those who used element correcting typewriters.

Kurtz (1978) and Allen (1978) investigated various aspects of goal setting and typewriting achievement. Kurtz examined the effects of goal setting and anxiety on accuracy of production typing task performance and found no significant differences among groups. Allen examined the effect of individual goal setting on the achievement of speed and accuracy and found no significant differences among participants on demographic, occupational, and educational variables. No significant differences were found in speed or accuracy achievements.

Timed writings were the topic of two research studies conducted between 1968 and 1980. In 1969, Nelson found that eliminating timed writings had no significant effect on speed, accuracy, or production achievement. A 1979 study by Murphy measured the effect on typewriting accuracy of erasing on straight-copy timed writings and prescribed drills. The control group used gross words per minute and total errors to measure performance on straight copy based on prescribed drills. The experimental group used mailable words per minute. The results showed that the students using mailable words per minute were able to regain their initial speed rates during the ten-week period of the experiment. Students using gross words per minute achieved a higher increase in speeds, however.

Three business education researchers chose proofreading as the object of their studies. In 1971, Wong compared the effects of three different methods of reading copy when proofreading. Among her findings were these: color did not affect proofreading time, but white or neutral paper gave better accuracy; two readings of the copy appeared to be best; one reading was insufficient, but a third reading did no more good.

Simon (1976) found no significant difference in proofreading performance between college students who received traditional proofreading instruction and those who received directed proofreading practice.

Snyder (1978) also studied proofreading at the collegiate level. She found that emphasizing proofreading and selected basic English rules in beginning college typewriting classes produced no significant difference in mean scores on an instrument measuring proofreading ability to recognize errors in capitalization, punctuation, spelling, and word division. In addition, no significant differences in mean scores on a final examination measuring typewriting production skills existed nor were significant differences shown in mean timed writing skills.

Three researchers conducted studies aimed at examining various methods of developing production typewriting skill. The first of these studies, conducted by Armstrong in 1968, compared three approaches to practice periods devoted to development of skill in production typewriting. Among the conclusions reached by Armstrong were these: setting of specific goals was not more effective than setting mean goals and stressing quality; none of the three approaches examined had a noticeable effect on straight-copy skill.

The Reha study conducted in 1971 compared two procedures for developing production typewriting skill. One method devoted fifteen minutes daily to typing basic drill or straight-copy material; the remainder of the class period was devoted to production activities. The second method devoted the entire fifty-minute class period to production activities. At the conclusion of the experiment, no significant differences in speed or accuracy were found. Production speed differences were insignificant; no significant difference was found in production typographical errors. In addition, no significant difference on form errors was shown.

A 1973 study conducted by Carr-Smith compared a teacher-directed and a traditional approach to teaching production work with the result that the teacher-directed method was found to be more effective for production preparation.

Thies (1968), Lauderdale (1971), Mach (1971), and Weise (1975) investigated various approaches to drill work. Thies concluded that drilling for speed using the explore, fast, faster, control approach resulted in significantly more accurate three-minute timings than drills that focused on awkward reach sequences/fluency sentences or those that focused on attempting to type for extended periods without error.

Lauderdale found no significant speed differences between third quarter students receiving intensive repetitive and those receiving extensive nonrepetitive practice. The intensive repetitive practice group typed with significantly greater accuracy.

Mach worked with first semester students in a similar experiment. He found that the nonrepetitive practice group typed significantly faster and more accurately on straight copy.

The Weise study dealt with the effects of repetition and alternating levels of practice on learning to typewrite. Four groups were used: two used repetitive practice, two did not. In addition, two groups received instructions to use alternating levels of practice; two received no such instructions. No significant speed or accuracy differences were found between the repetitive and nonrepetitive groups. The groups directed to use alternative practice levels achieved higher speeds and lower errors.

In 1974, K. F. White conducted an experimental study utilizing varied scheduling and out-of-class assignments in intermediate collegiate typewriting. Those students meeting in-class two days per week with outside assignments did significantly better than those who met four days per week with in-class assignments on the following: gains in total scores from pretest to posttest, gains in total words typed, and in total points earned. No significant differences in accuracy gains were found.

A similar topic was examined by Ziemer (1976) when she compared typewriting achievement of students attending beginning typewriting classes three and five days a week at the community college level. No significant differences were found on gross words per minute, errors per minute, or production.

Guidance, reinforcement, and feedback are the topics researched to various extents by six business educators.

Parker (1979) examined the extent to which psychological theories of guidance and reinforcement are explored through typewriting and shorthand research. Her findings included these: as a guidance technique, prose and contrived copy could be effective in the beginning stages of typewriting; high speed drill was an improved method of speed building in the first semester; elementary collegiate typewriting could be taught effectively through individualized instruction.

Zeller (1979) compared continuous, terminal, and delayed reinforcement in advanced typewriting. Letter production tests showed no significant differences among the three procedures. On the table production test, the terminal reinforcement group did best. No significant differences were found for manuscript or forms.

Currie (1974) studied the effectiveness of videotape feedback upon student self-evaluation and achievement in beginning typewriting. She found no significant differences in achievement on speed, accuracy, or technique on straight copy.

A similiar study conducted by Vining (1976) investigated the effects of self-observation upon speed and accuracy development in collegiate beginning typewriting. A significant difference in favor of the group that viewed videotapes of their own performance was shown on five-minute timing speed. No significant differences were found on three-minute timing speed or accuracy or on five-minute timing accuracy. The results of the McCreary (1968) study were supported by Vining. The McCreary study, which examined the effect of the videotape recorder on student self-analysis in production typewriting, revealed that videotape self-analysis could assist students to become faster on straight copy timings without losing accuracy.

Blixt (1977) compared the effects of monetary reward, feedback, and no feedback on the achievement of high school typewriting students. From her finding, Blixt concluded that monetary reward did not significantly affect increases in typing performance and that once students reached similar levels of typing achievement, subsequent performance under the same learning conditions would not significantly differ.

Plagens (1978) and Hatcher (1979) conducted research to determine whether it was possible to teach composition at the typewriter without affecting basic typing skill development. The results obtained from these studies were fairly similar. Both researchers found that basic typing skill was unaffected by the use of composition materials in the typewriting course and that no significant difference in quality of composition existed between control and experimental groups. The research findings differ, however, in the area of quantity produced. Plagens found that those who received composition instruction produced a significantly greater amount of material; Hatcher found that those who received composition instruction produced significantly fewer words.

The studies summarized in the remainder of this section cover a variety of typewriting methodology topics. They are listed alphabetically by author.

Bloomquist (1968) identified digital typewriting patterns at three selected levels of skill. The findings indicated that stroking patterns did exist in the three levels. The stroking patterns within the three levels were highly variable.

Blume (1978) compared typewriting achievement of high school students having one or two semesters of instruction, who were enrolled at different grade levels, and who earned different final grades. The students who had taken two semesters of typewriting performed better than those who had one semester of typewriting on the information test, the straight-copy test, and

the production test. Varying results were obtained on the three tests based on grade level and final grades.

Byford (1971) investigated language-drill effectiveness in second semester secondary typewriting. No differences in typewriting achievement were found, but those receiving language drills did better on the language arts posttest and follow-up.

Cignetti (1974) compared the effect of intraclass and traditional grouping on students' terminal achievement. She found significant differences based on instructional method on only one variable.

Cummins (1974) found that no significant differences in speed, accuracy, or attitude existed between groups of high school students receiving extrinsic awards and those receiving grades on five-minute timed writings.

Dixon (1976) conducted a study to determine what effect the letter-level technique had on reduction of errors on five-minute timings among tenth and eleventh grade students at an inner-city school. The results indicated that the letter-level students typed with greater accuracy.

Gould, Jackson, and Hopkins (1978) compared typewriting skills in cooperative office education, model office, and office procedure classes. They found that no one cooperative course was significantly more effective in developing typewriting skill.

Granger (1977) compared performance of students who (1) were timed on all activities and submitted all papers daily, (2) typed for five days and turned in all papers at once, and (3) alternated between plans one and two. No significant differences were found.

Hart (1971) identified and interpreted the evolution of terms and associated methodology of basic skills associated with beginning typewriting. The findings indicated that terms were stable from 1880 to 1969. Methods, however, changed.

R. M. Jones (1973) researched the effect of visual reinforcement of keyboard locations on student achievement in typewriting speed, accuracy, and net production in secondary and collegiate beginning typewriting. She found no significant differences in semester one at the secondary level.

Missling (1970) compared the traditional scheduling plan to three flexible modular plans in first semester high school typewriting. Among her findings were that classes that met for thirty-five minutes each day and where students had access to open labs generally achieved a higher rate of speed on straight copy; and that students in traditional scheduling typed more accurately on straight copy.

Muckleroy-Simpson (1976) analyzed teacher-pupil activity in selected first year typewriting classes. She found that teachers and pupils seldom deviated from the objective of the lesson. Solicitations were in the imperative mode and the responding students' moves were nonverbal. The characteristics of typing speed development lessons were similar to those of social studies, stenography, and other classes.

Page (1975) studied the relationship of perceived classroom climate as established by instructor behaviors and achievement in a psychomotor skill and found no significant relationship.

Rainey (1976) conducted a study to determine the effect of two instructional methods on psychomotor performance of students who varied in dexterity and who were paced at varying (five, ten, and fifteen words per minute) speeds in beginning typewriting. When instructional methods were considered independently, the Modified Traditional Presentation method was better for gross words per minute and errors than was the Audio-Visual Presentation method. Dexterity did not contribute to speed at the introductory phase; it did influence the number of errors. As the pacing speed increased, so did the gross words per minute and errors.

Rankine (1968) examined the effects of augmented feedback, remedial practice, and their combination on improvement of typewriting accuracy. He found that both augmented feedback, remedial practice and their combination resulted in significant gains in typewriting accuracy for letter-level students. For word-level students, augmented feedback did not contribute to any significant gains in accuracy; remedial practice was found superior in some instances. Remedial practice had no effect on accuracy of the students at the phrase level.

Stamps (1974) compared the traditional textbook method and the in-basket exercise method of teaching production typewriting at the postsecondary level and found that those students using in-basket exercises achieved better production typewriting skills.

Synnes (1976) compared the achievement and knowledge of business fundamentals and general information of students with backgrounds in office lab/model office classes with four semesters of typewriting, those with office lab/model office class with less than four semesters of typewriting, and those in their fourth semester of typewriting. Significant differences in favor of each of the three groups were shown on various items analyzed. No significant difference among groups was shown in number of typographical errors on letter and manuscript tests.

West (1972) recommended, as a result of his research, that traditional typewriting instructional procedures should be reversed. Little time should be devoted to straight copying skills, vocational typewriting should be introduced very early, and explicit instructions and practice on judgment placement should be given. This instruction/practice session should be followed immediately by practice in placement decision making on totally unarranged copy without teacher help.

Evaluation

The studies conducted in this area of business education cover a wide range of topics. For this reason, they will be organized and summarized in alphabetical order by author.

Barnett (1972) found little agreement among teachers on the criteria used for end-of-course grades in typewriting, shorthand, and machine calculation. Quality and quantity weights were also a source of disagreements. Speed requirements varied for typewriting and shorthand. Differences were shown between teachers and employers/secretaries on skill ratings and requirements for successful entry-level employees.

Boose (1974) experimented with the effects of tapping ability and the use of tactile cues in the acquisition of typewriting skills. The results of the research indicated that no significant difference existed between performance on tactile and regular keyboards.

Chance (1975) developed pretests and posttests for typewriting. Each test contained both objective and performance items. The tests met the reliability standard set and most of the other criterion measures used, including those set for similarity of forms and for letters, tabulations, manuscripts, and typing numbers in context test items.

DeHaven (1969) investigated the effect of typewriting on seventh grade students' ability to recognize composition errors and learned that students who proofread typewritten compositions did not recognize a significantly greater number of errors than those who proofread handwritten compositions. A significant gain in writing skills was achieved by those who had practice in typing their language arts assignments, however.

Erickson (1975a) found that differences in socioeconomic status did have an effect on typewriting speed and accuracy. Performance differences in overall speed, errors, and net words per minute were noted between high and low groups, and differences in errors and net words per minute were found between high and middle groups. These differences were indicated at all levels of copy difficulty.

Fischer (1972) analyzed selected variables to determine their relationship to straight-copy and application typewriting performance. Among his findings were these: significant predictors of business letter typing achievement are numerical aptitude, motor coordination, intelligence, verbal aptitude, spatial aptitude, and sex; significant predictors of straight-copy achievement were straight-copy typing performance at the beginning of the semester, numerical aptitude, tenth grade English grammar, and sex.

Good (1970) concluded from his research that students achieved as well in large classes as in small classes. No significant differences between groups were found on a basic information test, straight-copy typing, or production units.

Holder (1977) developed an instrument to determine typewriting competence of students entering postsecondary typewriting programs. The tests that were run on the instrument indicated that the content was valid and reliable, that the knowledge section was consistent, and that all sections of the instrument were stable.

Hussain (1972) found a uniform acceleration in linear trend of speed among first year typists. No significant growth trend was found for accuracy. Different speed patterns were found on electric typewriters than on manual typewriters.

Javed (1973) studied the effect of handedness on typewriting performance and found no significant difference in speed or accuracy among students who used manual typewriters. For those using electric typewriters, no significant difference was found when the teacher variable was controlled; a significant difference was found when the teacher variable was not controlled.

Llewellyn (1970) examined the relationship between selected silent word perception skills and achievement in first year high school typewriting. He found that the sound identification subtest was the only one to show a significant relationship with typewriting performance.

Maxfield (1972) discovered that when the variables of sex, treatment, age, reading ability, and intellectual ability were combined, there were significant differences favoring the group that received training in listening. The study was conducted to determine the relationship of listening ability and comprehension to first-year typewriting achievement.

McLeRoy (1968) concluded from his research that department chairpersons rated higher those teachers who had earned masters degrees, were doing graduate work, held professional memberships, taught both shorthand and typewriting, and did not grade papers in class. His analysis of teaching beliefs revealed agreement among teachers.

Mullen (1974) investigated the relationship of students' conceptual level and their success in a collegiate self-paced program in intermediate typewriting. No significant differences between timed writing scores earned by students using self-paced and traditional instructional methods within the differing conceptual levels were indicated.

Olson (1978) developed a kinesthetic-sensitivity instrument that was valid and reliable during the first six weeks of instruction as a predictor of straight-copy scores on gross strokes, correct strokes, and errors.

Payne (1979) found that there was an aptitude-treatment interaction which affected achievement in beginning typing based on selected aptitude and criterion measures.

Redfern (1968) concluded from her follow-up study of junior high typewriting students that junior high typewriting can be justified. An analysis of the data obtained through the questionnaire that was developed revealed that no one grade level is the best for teaching typewriting in the junior high. A majority of those responding recommended a junior high course of two semesters with emphasis on mastery of basic typewriting skill as the objective.

Rosenbloom (1979) conducted a research study to determine the degree of match between students' cognitive styles and a theoretical cognitive style map that was set for an audiovisual tutorial package as an indicator of success on the package. Using a pairwise comparison, no significant differences were found among three cognitive style match groups in theory scores, production, speed, accuracy, and overall grade.

Stuart (1971) determined that reading and spelling ability significantly predicted proofreading performance as measured by the number of errors found or missed and as measured by the time required to complete the test. Those who participated in the study were able to locate more errors when they typed and corrected copy than when they circled errors with a pen.

Von Schlick (1969) investigated the relationship between test scores on straight-copy typewriting and simulated office production problems as measured on electric typewriters. She found a highly significant positive correlation between speed and accuracy on straight copy and test scores on nine office production tasks. She also concluded that the percentage of straight-copy skill transferred to various office production problems was different for typists at different speed levels with the greatest range of transfer occurring in the lowest 25 percent.

Williams (1973) studied the perceptions of core area students' value of advanced typing and social studies courses. In addition, he explored the relationship of their expectations to performance. Students at core and suburban schools were participants. Among the results of his research were findings that indicated insignificant correlations between expectancy and performance at both core and suburban schools. A significant difference in performance in favor of suburban students was also shown.

Yrle (1977) investigated the relationship between personal and interpersonal values and production performance of students enrolled in advanced typewriting. She found that nonmajors' values were related to performance only in the early stages of production skill acquisition. Overall and major grade point averages were related to production performance.

Summary

Studies dealing with typewriting course content concluded that textbook production materials should more nearly simulate office conditions (Wise 1968; Stewart 1970; Ober 1974). Integrating other subject areas, such as business vocabulary or economic concepts with the learning of typewriter skills proved successful in the studies of Bell (1972) and Feese (1976). Ruetten (1976) found reading skills to be enhanced through typewriter use.

Research on students with special needs showed a number of factors to influence success in transcription for blind students (Freedman 1968; Wonderling 1971). For certain groups, typewriting led to improvement in language arts skills (Gladis 1970) and motor development (Fant 1969) as well as in helping potential dropouts remain in school.

Among the numerous studies on individualized and multimedia instruction, research on elementary-level students (Rhea 1975; Kline 1971) indicated that traditional instruction resulted in better technique. Studies at the secondary level indicated that individualized instruction could result in greater speed (Thoreson 1971; Varnon 1973) or in more accurate typing of production copy (Thoreson 1971). Similar findings at the college level were reported by Frye (1972), Lauer (1972), and Beard (1976), although Lauer found it to produce more errors on straight copy. Other college level studies, however, indicated no significant advantage in achievement for either the traditional or nontraditional teaching methods (Warner 1969; Klemin 1973; Sherrill 1975; Stearns 1978).

Other metnodology studies during the period 1968-1980 have focused on the roles of the typewriter keyboard, timed writings, proofreading, drill work, class scheduling, and composition in typewriting achievement; the effects of guidance, reinforcement, feedback, and other psychological influences; and the effectiveness of various teaching techniques.

Findings of interest in these areas would include Nelson's 1969 finding that eliminating timed writings had little effect on achievement; Thies' success with the "explore, fast, faster, control" method in speed drills (1968); the gains of students having outside assignments and varied schedules in K. F. White's study (1974); and West's (1972) deemphasis on straight copying in favor of emphasis on learning the placement of unarranged copy.

Studies on instructional materials and typewriting technology concluded that either prose or contrived copy can be used effectively for beginning typewriting (Long 1977); and that proof guides, simulators, and wall or keycharts had little effect as instructional aids (Hilgedick 1976; Shaffer 1976; Guyot 1973; McKown 1979).

Evaluation studies showed a lack of consensus between teachers on grading criteria, and between teachers and employers/secretaries on skill levels needed by beginning employees (Barnett 1972); a uniform acceleration in linear trend of speed, but no significant growth trend for accuracy, among first year typists (Hussain 1972); and the relationship of listening ability and comprehension to first-year typewriting achievement.

WORD PROCESSING

Methodology

A total of twenty-nine doctoral dissertations or independent studies was reviewed in the area of word processing. Approximately three-fourths (75.9 percent or twenty-two) of the studies were completed during the period 1977 to 1981.

More than two-fifths (41.4 percent or twelve) of the studies reported on data from one city whereas one-tenth (10.3 percent or three) of the studies reported on data from one state. Two of the studies (6.9 percent) reported on data gathered from national samples. The remaining studies (twelve) reported on data gathered from the following sources: regions of the United States (five studies), schools (two studies), area vocational technical school (one study), university (one study), regions of a state (two), and documents (one).

The most frequently used research methodologies were mailed questionnaires (31.0 percent or nine studies) and personal interviews (31.0 percent or nine studies; Table 1).

Research Methodology	Number	Percentage
Descriptive Test Data Analysis	1	3.5
Mailed Questionnaire	9	31.0
Observation, Interview, and Delphi	6	20.7
Materials Analysis	1	3.5
Personal Interview	9	31.0
Quasi-Experimental	3	10.3
TOTAL	29	100.0

Approximately three-fourths (75.9 percent or twenty-two) of the studies reported on data gathered from business personnel (word processing operators, secretaries, administrative support personnel, and principals). Twenty percent of the studies included the use of students and educators.

The majority (65.5 percent or nineteen) of the studies were concerned with the investigation of word processing centers/stations and personnel with implications for business education curricula and/or program development. Three studies included an examination of predictions for word processing in the office of the future. Two studies investigated word processing methodology, and another study sought predictive measures of success in word processing. One study reported on the development of instructional materials. Five studies examined job satisfaction of word processing personnel.

The following sections will summarize the research in the main areas of current word processing practices, impact of technology on office procedures, teaching methods, prognosis in word processing, and analysis of instructional materials. Job satisfaction of word processing personnel, investigated by Benjamin (1976), Casady (1973), Kutie (1977), Mitchell (1978), and Reiff (1974), was reported in the chapter entitled Social and Business Environment.

Current Word Processing Practices

A national study was undertaken by Delta Pi Epsilon to determine current practices in word processing installations throughout the United States (Scriven et al. 1981). Members of more than 90 percent of the Delta Pi Epsilon chapters throughout the United States assisted in the data collection phase.

Several researchers have investigated word processing installations in business organizations in major cities (Bragg 1976; Chiodo 1980; Claffey 1979; Gillard 1978; D. M. Johnson 1979; Kusek 1974; Larson 1980; McCrary 1979; Mitchell 1978; Murranka 1979; Ott 1979; Powell 1975; Reiff 1974; and Rohrer 1978).

Some researchers gathered their data from word processing personnel and installations within a region of the United States (Kutie 1977; P. S. Nichols 1979) and some from within a state (Barbieri 1980; Ott 1979; Spring 1977; and Turner 1977).

In assessing current practices in word processing installations, the studies in general sought to determine entry-level qualifications, tasks and/or competencies, and job satisfaction of word processing personnel. Implications for curricula in business education were then derived from the findings.

Entry-level Qualifications

Researchers in general found English skills, secretarial skills, and human relations skills important for those seeking entry-level word processing positions. Many of the researchers (Claffey 1979; Larson 1980; Moody 1978; Ott 1979; Powell 1975; Rohrer 1978; Scriven et al. 1981) reported that the ability to apply English skills was of utmost importance for those seeking word processing positions.

Scriven et al. (1981) and Spring (1977) reported that a majority of the organizations surveyed administered a straight-copy, timed writing test to prospective entry-level word processing operators and administrative support secretaries. Scriven et al. reported that approximately one-third of the organizations surveyed administered some form of grammar test. Some of the researchers (Murranka 1979; Ott 1979; Scriven et al. 1981) found that shorthand skills were either required or being used by administrative support secretaries. However, the trend appeared to be a reduced need for shorthand skill in organizations with word processing installations. Applied English skills and professional attitude toward work were areas in which entry-level administrative support secretaries required training beyond the requirements for traditional secretaries.

In investigating the education level of word processing operators, many of the researchers reported that word processing operators had at least a high school diploma. However, word processing operators were not often recruited from public or private high schools or institutions. Many of the firms indicated the importance of previous work experience in hiring operators as well as training on word processing magnetic equipment. Administrative support personnel were most frequently recruited from within the organization.

Tasks and/or Competencies

Tasks performed by word processing operators/correspondence secretaries included typewriting and transcription, proofreading, maintaining a filing system, operating and caring for office equipment, using reference manuals, and following directions (Scriven et al. 1981).

Administrative support secretaries were found to spend more working time in the area of written communications than in any other area (Scriven et al. 1981). Some of the duties performed by administrative support secretaries included composing written communications from oral directions and longhand; typing; answering the telephone; organizing the flow of incoming mail; meeting callers; making appointments for employees; scheduling conferences and meetings; maintaining general and desk reference files; making recommendations concerning office systems; procedures and supplies; and using a copy machine. Administrative support secretaries reported high frequencies for typing (Kusek 1974; Moody 1978; Murranka 1979; and Scriven et al. 1981).

Scriven et al. concluded that the competencies required for entry level word processing operators/correspondence secretaries and administrative support secretaries included typing from handwritten, typed, and rough draft copy; applying English and grammar skills; following directions and listening; meeting and greeting people; answering telephone calls; and using a filing system.

Implications for Business Education Curricula and Training Programs

Moody (1978) and Scriven et al. (1981) were in agreement that schools should be responsible for teaching the following competencies in preparing individuals for word processing operator/correspondence secretary and administrative support secretary positions: grammar and transcription skills, typing, and operation of dictation equipment. Scriven et al. also concluded that word processing operator/correspondence and administrative support secretaries should be prepared by schools to listen and follow directions, operate adding machine equipment, read and interpret documents, use reference manuals, use a filing system, schedule and screen appointments, organize and maintain a retention filing system, answer telephone calls, and arrange reservations. In addition, Moody recommended the need for office occupations curricula to include training in composing letters and suggested schools consider placing some cooperative education students in word processing centers. Moody recommended that business training programs provide assistance in the use of a filing system and give more attention to the development of administrative skills such as giving and following directions, managing employee records, and training new word processing personnel.

Gillard (1978) developed a curriculum model in word processing for postsecondary business education programs.

In assessing the continuing education needs of word processing and traditional secretarial personnel, Kusek (1974) found that only one learning need, listening to and following verbal instructions, differed significantly between the two groups, with word processing personnel indicating greater learning need in this area.

Barbieri (1980) found that most of the supervisors' competencies could be taught on-the-job or "either in school or on-the-job" whereas principals' competencies were designed to be taught "either in school or on-the-job." Barbieri suggested businesses emphasize functions and

responsibilities of supervisors, stressing administrative skills, in training programs. Dictation and grammatical skills were important competencies for both supervisors and principals. Scriven et al. found the job responsibilities of word processing supervisors/managers and administrative support managers could be categorized under the functions of a manager: planning, organizing, controlling, and directing and coordinating. Word processing and administrative support supervisors/managers were found spending more of their working time in directing and coordinating activities (Scriven et al. 1981 and Murranka 1979).

Two studies compared tasks of word processing personnel (administrative and/or correspondence secretaries) and traditional secretaries. Bragg (1976) found some significant differences in tasks that word processing and traditional secretaries considered most time consuming, most difficult, and major. Traditional secretaries rated the competency of developing new office procedures to improve office efficiency as being more important in their work than word processing secretaries in a study completed by Kusek (1974).

The behavior-oriented job dimensions of word processing personnel were investigated by Kutie (1977) and Murranka (1979), as well as of traditional secretaries by Kutie. While both used the Position Analysis Questionnaire (PAQ), different versions were used. Kutie (1977) found significant differences among the six groups of secretaries (traditional, administrative support coordinator, administrative support secretary, word processing operator, word processing lead operator, and word processing supervisor) on sixteen of the thirty-two job dimensions measured, indicating that job behaviors varied among secretarial positions. The two dimensions for which the greatest difference existed were (1) making decisions and (2) communicating judgments, decisions, and information. The traditional secretarial position differed greatly from the word processing position, with the word processing operator position characterized by equipment operation and use of hands and arms to control or modify.

Murranka (1979) also concluded that decision-making skills and interpersonal communication skills were important for administrative secretaries and supervisors.

Impact of Technology on Office Procedures

Lewis (1977) sought to determine the effect of word processing on business letter writing practices, concluding that while personal handwriting was the most popular business letter origination method prior to word processing (accounting for approximately 46 percent of all letters written), direct telephone dictation to word processing centers was used to the greatest extent after word processing implementation (accounting for approximately 38.5 percent of all letters).

In comparing the amount of time required to dictate and transcribe a 300-word individually dictated letter via the word processing center method and the stenographic method, no statistically significant difference resulted in dictation time and transcription time required by the originator and transcribers (Chiodo 1980). However, more time was required to move a document between the originator and the word processing center than between the originator and the stenographer.

O'Sullivan (1977) compared the forecasts of business and education groups concerning the importance of word processing systems in the office of 1984. Forecasts about the areas of technology, work environment, and implications for office education were compared. Most of the significant differences between educators and business personnel resulted in responses to

questions concerning the work environment. Educators did not agree with business groups that secretarial functions would be divided into correspondence and administrative responsibilities. Important differences were also noted between business groups and educators about the need for shorthand writers in the office of the future and the value of credit given for work experience.

Opinions about the future of word processing and its effect on future employees were gathered from word processing industry experts (Scriven et al. 1981). All respondents were in agreement that in the future there would be a greater information interaction between word processing and data processing. By 1985 the industry experts forecast a stronger emphasis on the concept of effectiveness rather than efficiency. Experts agreed that executive and professional productivity gains would be sought as well as increased clerical and secretarial productivity and that word processing would be a transition from a document production tool to a management tool.

Teaching Methods

Two of the studies evaluated methods of instruction in word processing. Overfield (1979) used a quasi-experimental design to determine if a model office simulation in word processing was an effective method of instruction to achieve differences in student behavior. Overfield found significant differences between the two office procedures classes (simulation and nonsimulation group) in relation to knowledge of word processing principles and concepts. However, participation in the simulation was not able to produce significant differences between the two groups relating to attitude toward work and interpersonal relations.

Matthews (1971) compared the effects of a variant of programmed instruction and conventional methods of instruction on the achievement of high school students enrolled in a summer college honors program. Achievement was measured by scores obtained on the Cooperative School and College Ability Test. Treatments were administered to the three groups as follows: group one—regular academic program, twelve thirty-minute lessons on the Magnetic Tape Selectric Typewriter (MT/ST) and a forty-five-minute discussion after each lesson; group two—regular academic program and twelve thirty-minute lessons on the MT/ST; and group three—regular academic program. A significant difference in achievement scores resulted between group one and groups two and three.

Prognosis in Word Processing

One study (Wilkins 1979) focused on examining the relationship of language, reading, and typewriting skills to machine transcription performance for word processing. Wilkins found straight-copy typewriting speed, spelling skill, punctuation ability, and reading comprehension made significant contributions to the variance accounted for in machine transcription performance. Typing speed and spelling skill were the major contributors to performance.

Analysis of Instructional Materials

Bennett (1980) developed a set of self-paced instructional materials for use with the IBM Memory Typewriter. Turner (1977) developed a manual to introduce students to word processing.

Summary

Most word processing research has focused on identifying current practices in word processing installations with implications for business education curricula and program development. Changing technology and work environments will require continued study by researchers if business education curricula and programs are to prepare individuals for positions in business. As word processing equipment becomes more readily available to business teachers, and as teachers begin to integrate word processing concepts into existing business courses, teaching and learning practices will require more attention from researchers.

With the transition of word processing from a document production tool to a management tool, new dimensions of research should be explored. In addition, with the interfacing of word and data processing, research in the area of information processing will become feasible.

SUMMARY

The sections of this manuscript have served primarily to organize the 1,129 doctoral dissertations and independent studies cited in this review that were completed in business and office education during the 1968-80 time period. The large number of studies made it impossible to review and synthesize adequately the research completed.

This section will make general observations about the research synthesized in this document. Those areas that continue to be research concerns or which have not yet been addressed by formal research will be identified. Both of these summary statements are made with caution and recognition of the limitations inherent in the present research review. Better critiques are needed that examine a more finely delimited number of studies—studies delimited by topic, by time period, and by the judgment that the research is of sufficient quality to permit generalizations. Adequate critique is not possible when thirteen years of research encompassing the total field of business and office education is examined. Neither is adequate critique possible when, as was necessary in this review, it is based largely upon research abstracts rather than complete reports.

Overview of Completed Research

Tables 1 and 2 are used to illustrate two ways of summarizing the research in the thirteen sections of this review. Table 1 organizes the research in these thirteen subject area sections by year of completion. Table 2 organizes the same thirteen sections by the type of research design used in the study. While a total of 1,129 studies is included in each table, it is important to recognize the qualification that double counting may be present for studies cited in more than one section of this report. The tallies for these tables came from examination of each separate chapter. A total of 1,104 different studies is included in this report.

Review of table 1 shows that the average number of doctoral dissertations or independent studies completed in each of the thirteen years is eighty-seven. The totals for the years 1968 and 1980 are underrepresentations since some 1968 studies were included in the earlier *Review and Synthesis of Research in Business and Office Education* (Price and Hopkins, 1970) and not all 1980 studies were indexed earlier enough in 1981 to be included in this review. Omitting these years, the average number of studies completed each year is ninety-three. The peak years for most of the subject areas were between 1971 and 1976. The slight downward trend after 1976 may be a reflection of the assumed oversupply of professional educators.

Both tables 1 and 2 show the skill areas of shorthand/transcription and typewriting together to account for 27 percent of the research in business and office education. The basic business areas account for 20 percent of the studies reviewed. Taken together the studies that examined the general educational environment or the social and business environment account for another 21 percent of the research. The areas of bookkeeping/accounting and business data processing each represent about 9 percent of the research reviewed. The communications area represents about 6 percent of the research. Business math and word processing each represent less than 3 percent of the research completed.

The number of studies completed specifically in the word processing area has tended to increase since the appearance of the first study in 1971. It is surprising that a similar trend is not apparent in the data processing area. The apparent stability of the number of studies in the business math and communications areas is also not consistent with the general concern in education for the development of fundamental quantitative and verbal skills.

TABLE 1

RESEARCH STUDIES IN BUSINESS AND OFFICE EDUCATION BY YEAR OF COMPLETION

AREA	YEAR													
	68	69	70	71	72	73	74	75	76	77	78	79	80	TOTAL
Philosophy and Objectives	0	4	1	2	2	3	1	2	0	1	1	3	1*	21
Educational Environment	3	4	9	10	18	9	11	4	12	11	7	9	9	116
Social and Business Environment	1	4	8	4	9	10	11	13	14	13	15	9	7	118
Career Education	0	0	0	0	3	0	2	4	2	1	1	3	1	17
Professional and Student Organizations	0	0	0	0	0	0	0	2	0	3	3	1	2	11
Bookkeeping Accounting	5	8	8	8	8	7	8	10	14	8	8	2	5	97
Basic Business	11	21	10	24	12	19	17	25	25	9	23	17	10	223
Communications	2	2	8	6	4	5	13	3	4	6	7	10	3	73
Business Math	0	1	2	1	3	3	1	5	4	3	5	2	0	30
Business Data Processing	3	4	5	11	7	13	14	6	5	9	7	3	5	92
Shorthand/ Transcription	5	8	18	23	12	10	13	13	16	13	14	10	9	164
Typewriting	10	8	8	13	10	11	13	12	17	11	10	11	2	136
Word Processing	0	0	0	1	0	1	2	1	2	5	4	8	5*	29
TOTAL	40	64	77	103	88	91	106	100	115	93	105	88	59	1,129

*Includes one study completed in 1981.

TABLE 2

RESEARCH STUDIES IN BUSINESS AND OFFICE EDUCATION BY TYPE OF RESEARCH DESIGN

	RESEARCH DESIGN															
	Experimental		Descriptive Test Data Analysis		Mail Questionnaire		Observation/ Interview Critical Incident		Materials Analysis		Materials Development		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Philosophy and Objectives	0	0	0	0	4	19.05	2	9.52	15	71.43	0	0	21	100
Educational Environment	6	5.17	24	20.69	56	48.28	17	14.66	10	8.62	3	2.59	116	100
Social and Business Environment	5	4.24	57	48.3	33	28.0	15	12.71	8	6.78	0	0	118	100
Career Education	3	17.65	8	47.10	3	17.65	3	17.65	0	0	0	0	17	100
Professional and Student Organizations	0	0	2	18.18	6	54.54	1	9.09	2	18 18	0	0	11	100
Bookkeeping/ Accounting	30	30.30	30	30.30	24	24.20	5	5.10	6	6.10	4	4.00	99	100
Basic Business	55	24.66	67	30.04	46	20.63	10	4.48	26	11.65	19	8.52	223	100
Communications	26	35.62	3	4.11	23	31.51	12	16.44	9	12.33	0	0	73	100
Business Math	18	60.00	5	16.67	5	16.67	1	3.33	1	3.33	0	0	30	100
Business Data Processing	15	16.30	13	14.13	39	42.39	16	17.39	7	7.61	2	2.17	92	100
Shorthand/ Transcription	77	46.95	49	29.88	17	10.37	6	3.66	15	9.50	0	0	164	100
Typewriting	93	68.38	31	22.79	6	4.41	0	0	4	2.94	2	1.47	136	100
Word Processing	3	10.34	1	3.45	9	31.03	15	51.72	1	3.45	0	0	29	100
TOTAL	331	29.32	290	25.69	271	24.01	103	9.10	104	9.21	30	2.66	1,129	100

Table 2 depicts in a general way the types of research carried out in the thirteen subject areas. The category "Descriptive Test Data Analysis" is ambiguous in that the same terminology could be applied to research in the "Mailed Questionnaire" or "Observation/Interview/Critical Incident/Delphi/ Q-Sort" categories. The "Descriptive Test Data Analysis" category was intended for those projects in which objective or performance testing instruments other than questionnaires were administered to one or more groups, but in which no experimental treatments were applied. Experimental treatments were most likely to be used in those studies that evaluated different teaching methods or materials.

Those subject areas in which approximately one-third or more of the studies were of an experimental nature are bookkeeping/accounting, communications, business math, shorthand/transcription, and typewriting. These are also the business education subject areas in which content could be said to be relatively stable. Teachers and researchers are, therefore, more concerned with "HOW" to teach effectively rather than "WHAT" to teach.

On the other hand, the subject areas of basic business, business data processing, and word processing have been characterized by more volatile content. Technological changes will likely continue to make content issues of paramount concern in data processing, word processing, and those office education topics related to information management, such as reprographics, micrographics, and telecommunications. The breadth of potential content in the basic business areas as well as the organization of this content into courses have been major research concerns. Further, the elimination of outdated content and unnecessary duplication of content in several courses are continuing problems for the basic business field.

Evaluation of the competencies attained in various basic business areas, such as economics or consumer education, has received more formal research attention than evaluation in any other subject area except shorthand. In the latter area prognosis of achievement, the difficulty of test copy, and the establishment of competency standards have been frequent research topics.

The area of professional organizations is conspicuous by its small number of studies. These studies might have been combined with either the educational or business environment categories. The lack of experimental research designs in studies examining professional or student organizations indicates the difficulty of asking whether the goals of such organizations could be accomplished by other instructional or educational experiences. Since student organizations have generally been judged to be cocurricular activities, or integral parts of business education programs, it would seem important to ask whether teacher and student time is well spent in these organizational activities in contrast to other options for developing leadership, social, or vocational skills.

While perhaps not a single, identifiable subject area, career education related specifically to business and office education has been the subject of relatively few studies. This may represent a problem of terminology as career planning and guidance concepts are integrated into several business and vocational educational programs and courses.

The career education concept that persons should choose employment in areas appropriate to their skills, abilities, and interests, and with consideration of the life-styles implicit in different careers has been evident in several studies. Some of these studies have been classified as examining the social and business environment. Such research has frequently been a means for identifying the "needs of business," or the competencies necessary for employment in different career areas. Early studies with this purpose frequently focused on the skills, knowledges, and

personal attributes necessary for selected job clusters. While such information is still necessary to keep vocational programs current, research of selected career areas could be said to be taking a broader perspective in its examination of job requirements.

Jobs in business offices are being examined from the perspective of broader dimensions. The more objective tallies of job tasks are being supplemented by qualitative examination of job satisfaction and potential sources of job stress. The image of various office occupations is being scrutinized as well as the implications of job stereotypes on career entry and advancement opportunities. Research is challenging business educators either to accept or repudiate the obligation of eliminating sexist stereotypes in the clerical/secretarial field in particular.

Before examining continuing research needs in the field of business and office education, additional comments are needed to identify omissions in previous studies. When it has been possible to examine complete reports of doctoral or independent research, a common deficiency has been a failure to develop an adequate conceptual base for the problem being addressed.

Such a conceptual base would permit the development of a research project that builds upon the theoretical constructs of other disciplines. The parent disciplines for business education are those of economics, management, educational psychology, and sociology, to name the most obvious fields upon which we draw for our knowledge base. Too frequently in doctoral research in our field, however, researchers neglect to cite literature outside of the specific business education subject area under investigation. Sometimes even previous business education research is treated superficially.

Failure to consider the conceptual base upon which a specific project can build is related to another noticeable flaw in the research now available. No model or systematic approach has been apparent to direct the development of research projects which could cumulatively build upon each other. Researchers are more likely to repeat what others have done than to complement earlier studies by following up on specific study recommendations. Such recommendations can be made more meaningful if a model is first defined to clarify the questions that have already been addressed in a given area, the questions which need to be asked next, and the questions which are dependent on answers to yet unanswered questions.

Related to this lack of a research model and the unmet potential for collecting cumulative data is the lack of longitudinal research. While doctoral research frequently does not permit the collection of data for extensive time periods, many questions related to program evaluation require successive collections of data from a single cohort of students. With these brief comments about apparent deficiencies of current research, suggestions need to be made about continuing research needs.

Recommendations for Future Research

Separate summaries in the previous thirteen sections of this document contain information that identifies some of the research needs in specific content areas. Each individual study in fact carried with it implications for further research. The following suggestions relate to issues not yet adequately addressed in business and office education research and not specific to single subject areas.

Business and office education programs need to be developed or modified to meet the needs of new or nontraditional groups of students. Some of these groups include the following:

- Students with emotional, social, or physical handicaps
- Women and men preparing for careers in job areas currently dominated by one sex
- Women returning to employment after several years of full-time homemaking or after leaving other types of work
- Persons retraining or upgrading skills for business and office occupations
- Retired persons seeking self-employment or new careers
- Minority groups possessing second-language or second-culture problems
- Persons possessing marked deficiencies in basic quantitative and verbal communication skills
- Persons (young and old) needing keyboarding skills for other than traditional office occupations

Research directed toward these groups needs to be concerned not only with designing programs appropriate for these special populations, but also with ways to attract these nontraditional groups to business education offerings. The effectiveness of "specialized" courses or programs must then be compared with alternative ways of accomplishing similar program or course goals. Different content, instructional materials, or different methodologies may or may not be required for different student groups.

The impact of microprocessor technology is just beginning to have significant impact on business education content and teaching methods. Certainly the impact of microprocessors on information processing practices in business offices will affect the content areas of accounting, data processing, and word processing. Dissemination of current research findings will be necessary to enable business teachers (both preservice and inservice) to keep abreast of technological changes. The fact that changes cannot be accurately predicted and that these changes will affect different business offices differently will place a premium on identifying the basic, transferable skills that students will need to adapt to new settings.

Although it will become more and more imperative that students be given in-school experience with microcomputers in order to gain the computer literacy competencies necessary for both personal and employment use, the problem of equipment expense will not be entirely obviated by declining equipment costs. Few schools will be able to replicate the information systems used by large corporations, nor the information networks upon which businesses of all sizes may eventually depend. As researchers struggle with identification of the basic quantitative, verbal, or problem-solving skills most useful for continual learning, the minimum microprocessor-based equipment necessary to practice these skills must also be delineated.

As schools continue to acquire microprocessors for instructional use, educational "courseware" is being developed for use on this equipment. Instructional software is being developed for business classes without any reference to existing research evidence about skill or concept learning in business subjects. Much software has already been sold without any evidence that it accomplishes its intended outcomes. The development, implementation, and

evaluation of instructional software for microcomputers will undoubtedly be areas for needed business education research for many years to come. The research currently existing for computer-based education should be examined as these projects are developed.

The use of microcomputers as educational tools will expand the learning opportunities available to persons in their homes, places of employment, and other "nontraditional" learning settings. Whether or not microcomputers are used as instructional aids, business training will continue to grow in such "nontraditional" locations as industry human resource development programs, and private educational institutions. Research is needed to assist business educators who are working or would like to work in these settings. If more job-specific training is transfered to the employment site rather than learned in public institutions, more persons will need to be prepared to work as trainers and program managers in private business training programs. Research is needed to assist business educators to respond to this challenge.

Encouragement and financial support for graduate and independent research can come from several sources: personal resources; university funding or funding from other local education agencies; state and federal educational research monies; and private corporations. In 1978 a new nonprofit foundation was incorporated for the specific purpose of giving financial support to the conduct and dissemination of research in the broad field of business and office. The Delta Pi Epsilon Research Foundation has been created for the primary functions of receiving tax-deductible contributions and endowments and using these funds for graduate or independent research. To date the Foundation has supported the compilation and publication of the book *The Early View of Business Education* by Frederick G. Nichols and made one grant for a national research project. It is anticipated that the Foundation will continue to be an important vehicle for supporting scholarly research in the field of business education as additional research proposals are accepted each year. The present office of the executive secretary of the Foundation is located in the Business Education Department at Mankato State University, Mankato, Minnesota.

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